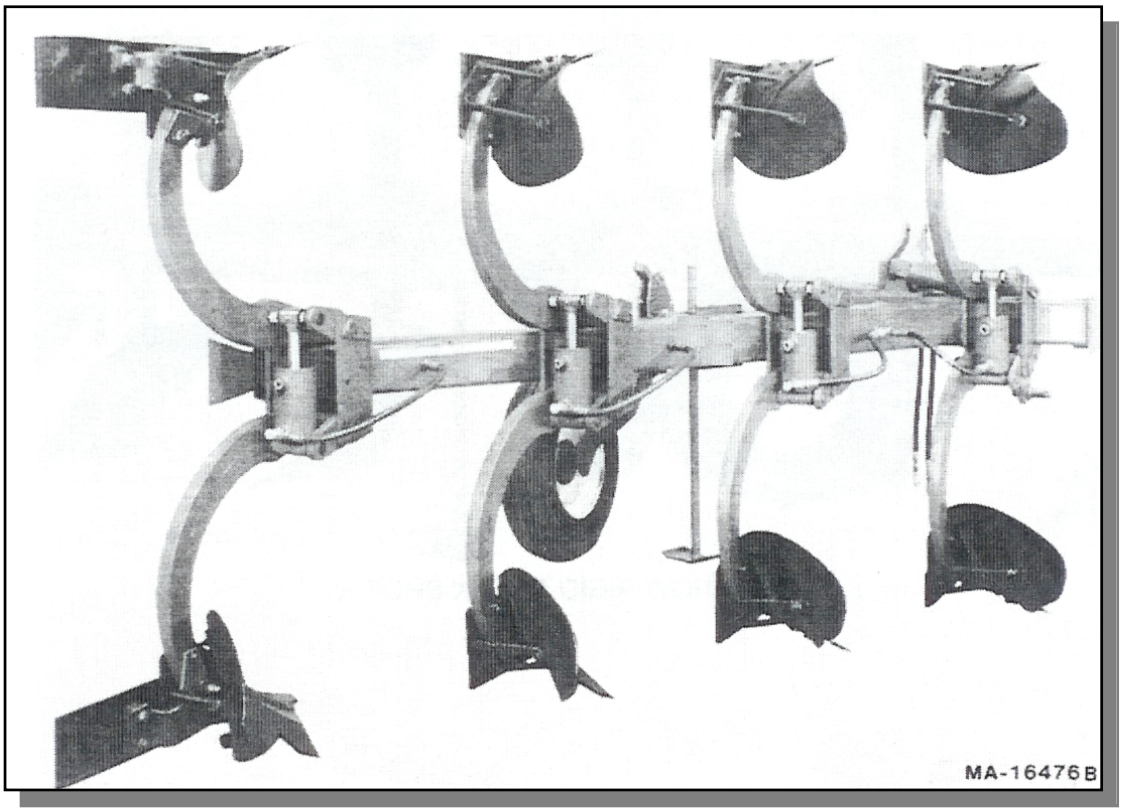
Building on a
Art's-Way
Tradition of Quality



OPERATOR'S MANUAL

Art's-Way Manufacturing Co., Inc.

Model 146
Moldboard Plow

Operator's Manual
519550

Issued February 2004

This symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED. The message that follows the symbol contains important information about your safety. Carefully read the message. Make sure you fully understand the causes of possible injury or death.

IF THIS MACHINE IS USED BY AN EMPLOYEE, IS LOANED, OR IS RENTED, MAKE SURE THAT THE OPERATOR UNDERSTANDS THE TWO INSTRUCTIONS BELOW.

BEFORE THE OPERATOR STARTS THE ENGINE:

1. GIVE INSTRUCTIONS TO THE OPERATOR ON SAFE AND CORRECT USE OF THE MACHINE.
2. MAKE SURE THE OPERATOR READS AND UNDERSTANDS THE OPERATOR'S MANUAL FOR THIS MACHINE.

WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH.

BEFORE STARTING THE ENGINE, DO THE FOLLOWING:

1. READ THE OPERATOR'S MANUAL.
2. READ ALL SAFETY DECALS ON THE MACHINE.
3. CLEAR THE AREA OF OTHER PERSONS.

LEARN AND PRACTICE SAFE USE OF MACHINE CONTROLS IN A SAFE AND CLEAR AREA BEFORE YOU OPERATE THIS MACHINE ON AJOB SITE.

It is your responsibility to observe pertinent laws and regulations and to follow manufacturer's instructions on machine operation and maintenance.

See your Authorized Art's-Way Manufacturing Co., Inc. dealer or Art's-Way Manufacturing Co., Inc. for additional operator's manuals, illustrated parts catalogs, and service manuals.

TO THE OWNER

Congratulations on the purchase of your new Art's-Way Moldboard Plow. You have selected a top quality machine that is designed and built with pride to ensure you have many years of efficient and reliable service.

Many people have worked on the design, production, and delivery of this Moldboard Plow. The information in this Manual is based on the knowledge, study, and experience through years of specializing in the manufacturing of farm machinery. This Manual is designed to provide you with important information regarding safety, maintenance, and machine operation so you can and will get the best possible performance from your Moldboard Plow.

Even if you are an experienced operator of this or similar equipment, we ask that you ***read this manual before operating this Moldboard Plow.*** The way you operate, adjust, and maintain this unit will have much to do with its successful performance. Any further questions you may have about this product of Art's-Way equipment should be directed to your local Art's-Way dealer or to Art's-Way Manufacturing Co., Inc., Armstrong, Iowa, 50514, (712) 864-3131.

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE

Art's-Way Manufacturing Co., Inc. is continually making product improvements. In doing so, we reserve the right to make changes and/or add improvements to our products without obligation for the equipment previously sold.

Modifications to this Moldboard Plow may affect the performance, function, and safety of its operation. Therefore, no modification are to be made without the written permission of Art's-Way Manufacturing Co., Inc. Any modification made without the written permission of Art's-Way Mfg. Co. shall void the warranty of this product.

In the interest of continued safe operation of this Moldboard Plow, pay particular attention to the safety alert symbol(s) throughout this Manual.

ART'S-WAY MANUFACTURING CO., INC. STATEMENT OF PRODUCT LIABILITY

Art's-Way Manufacturing Co., Inc. recognizes its responsibility to provide customers with a safe and efficient product. Art's-Way Manufacturing Co., attempts to design and manufacture its products in accordance with all accepted engineering practices effective at the date of design. This statement should not be interpreted to mean that our products will protect against the user's own carelessness or failure to follow common safety practices nor will Art's-Way Manufacturing Co., be liable for any such act. In addition, Art's-Way Manufacturing Co., assumes no liability for any altered product or any modified product by users or anyone other than an authorized dealer.

IMPORTANT WARRANTY INFORMATION

The warranty for this Moldboard Plow appears on page 2 of this Manual. In order to establish proper warranty registration, the Warranty Registration and Dealer Pre-Delivery Checklist must be completed and returned to the factory. Failure to comply with this requirement may result in reduced warranty allowances.

LIMITATIONS OF THIS MANUAL

This Manual contains operating instructions for your 146 Moldboard Plow only. Any mention of other machinery in this manual other than the 146 Moldboard Plow is for reference only. This manual does not replace nor is it to be used for any machinery that may be attached to or used in conjunction with the 146 Moldboard Plow.

PARTS & SERVICE

As the new purchaser of your Moldboard Plow, it is very important to consider the following factors:

A. Original Quality

B. Availability of Service Parts

C. Availability of Adequate Service Facilities

Art's-Way Manufacturing Co., Inc. has an excellent dealership network ready to answer any questions you may have about your Moldboard Plow. Parts for your machine may be ordered through our dealers. When placing a parts order, please have the ***model*** and ***serial number*** ready. This will allow the dealer to fill your order as quickly as possible.

For your convenience, we have provided this space for you to record your model number, serial number, and the date of purchase, as well as your dealer's name and address.

Owner's Name: _____

Owner's Address: _____

Purchase Date: _____

Dealership Name: _____

Dealership Address: _____

Dealership Phone No.: _____

Machine Serial Number Location

Enter the serial number and model number of your Moldboard Plow in the space provided above

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SAFETY FIRST

"A careful operator is the best insurance against an accident"

(National Safety Council)

Most accidents can be prevented if the operator:

- Fully understands how the machine functions
- Can anticipate situations which may produce problems
- Can make necessary corrections before problems develop

THIS SYMBOL MEANS ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!

Figure 1: The Universal Safety Alert Symbol

The American Society of Agricultural Engineers has adopted the ***Universal Safety Alert Symbol*** (See Figure 1) as a way to identify areas of potential danger if the equipment is not operated correctly. ***Please be alert whenever you see this symbol in the manuals or on your harvester.***

Art's-Way Manufacturing Co., Inc. strives to make our equipment as safe as possible. The Art's-Way Sugar Beet Harvester conforms to applicable safety standards at the time of manufacturing. A safety conscious equipment operator makes an effective accident-prevention program complete.

Safety features and instructions for the Sugar Beet Harvester are detailed elsewhere in the Operator's Manual. It is the responsibility of the owner to ensure that ***all*** operators read and understand the manual before they are allowed to operate the beet harvester. ***(Occupational Safety and Health Administration (OSHA) regulations 1928.57.)***

NOTICES OF DANGER, WARNING, AND CAUTION

Signal Words: Note the use of signal words DANGER, WARNING and CAUTION on the harvester and in this manual. The appropriate signal word for each has been selected using the following guidelines:

DANGER: Immediate and specific hazard which *will* result in severe personal injury or death if proper precautions are not taken.

WARNING: Specific hazard or unsafe practice *could* result in severe personal injury or death if proper precautions are not taken.

CAUTION: A reminder of good safety practices. Personal injury *could* result if proper procedures are not followed.

WORK SAFETY

Instructions given with this symbol are for personal safety. Be sure you and your workers follow them.

A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT

Figure 2 - Operator's Safety Manual

CAUTION! Before handling ANY equipment, READ the OPERATOR'S MANUAL.

Before handling any equipment, read the operator's manual.

BEFORE OPERATING

Misuse or modification of this machine can cause:

- Mechanical breakdown
- Property damage
- Injury or death

Always use proper safety precautions. Tell your workers how to work safely

Do not wear loose-fitting clothing that may catch in moving parts.

Use extreme care when making adjustments.

Always use the proper tolls or equipment for the job at hand.

When working under or around the plow, always support the plow frame.

Before lowering the plow for unhitching, lower and secure the parking stand.

After servicing, be sure all tools, parts or servicing equipment are removed from the plow.

Use only metric tools on metric fasteners.

Make sure that here is no one near the plow just before and during operation.

DURING OPERATION

No one other than the operator should ride on the tractor. Never allow anyone to ride on the plow at any time.

INSPECT all hydraulic hoses for leaks, cracks and abrasions once a year. Tighten fittings or replace hoses as needed.

Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result in medical treatment is not given immediately. Make sure all connections are tight and that hoses and lines are in good condition before applying pressure to the system. To find a leak under pressure use a small piece of cardboard or wood. Never use hands.

Do not attempt to remove any obstruction while the plow is in motion.

Keep hands, feet, clothing and other objects away from moving parts.

When adjusting or servicing hydraulic reset or spring trip units, be sure to keep hands and fingers away from pivot linkages and joints.

Use extreme care when operating close to ditches, fences or on hillsides.

ON-HIGHWAY OPERATION

Always place the plow in the transport position.

The tractor required for proper road transporting of this plow, should equal the size and have the horsepower rating of the tractor used for field operation.

Comply with your state and local laws governing highway safety and with regulations when moving machinery on a highway.

Drive at a reasonable speed, not in excess of 20 mph (32 km/h) to maintain complete control of the tractor and implement at all times.

LEFT AND RIGHT SIDE OF IMPLEMENT

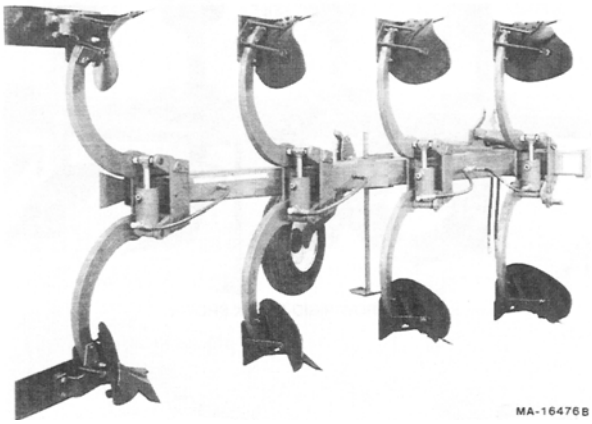


Figure 3 - Four Furrow Hydraulic Reset Trip Shown

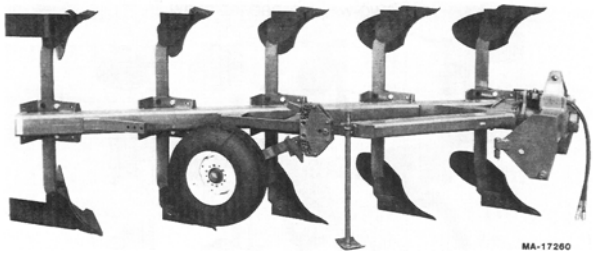
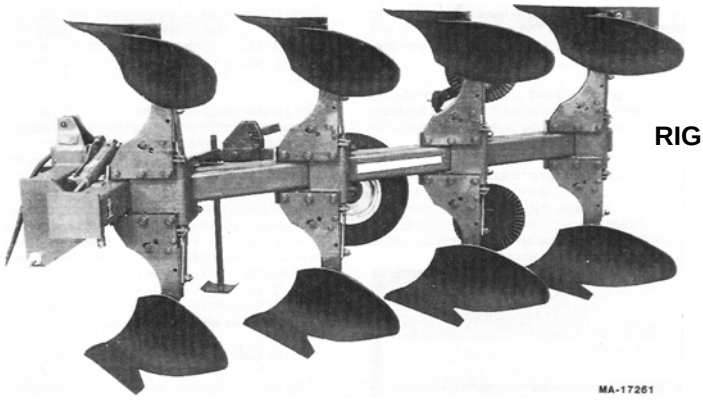


Figure 4 - Five Furrow Rigid Shank Shown

LEFT



RIGHT

Figure 5 - Looking Forward From Behind The Moldboard Plow

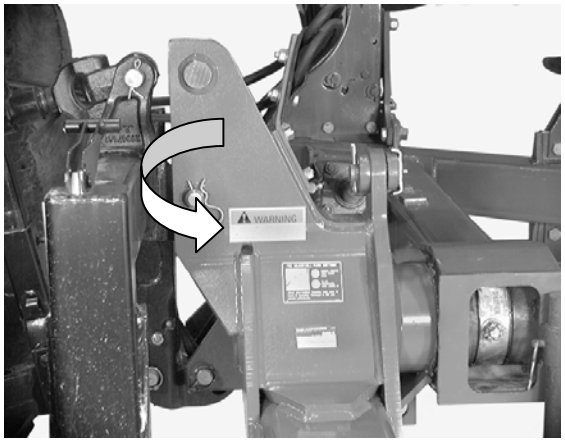
Whenever the terms left and right are used, it should be understood to mean from a position behind and facing the machine

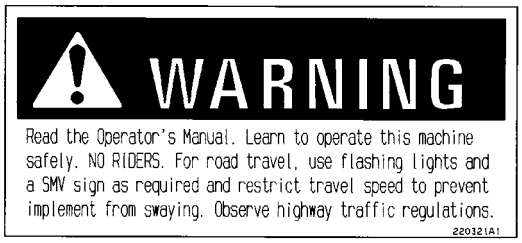
.

DECALS

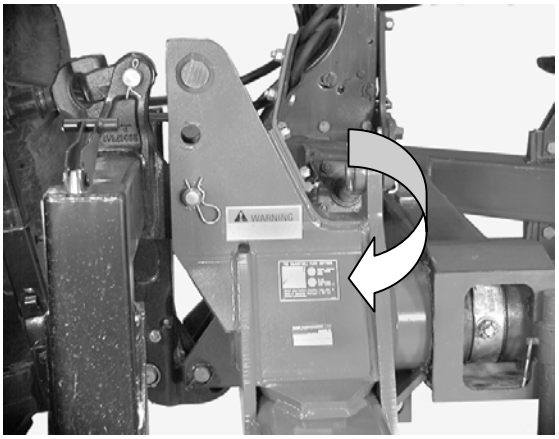
IMPORTANT: Install new decals if the old decals are destroyed, lost, painted over or can not be read. When parts are replaced that have decals, make sure you install a new decal with each new part

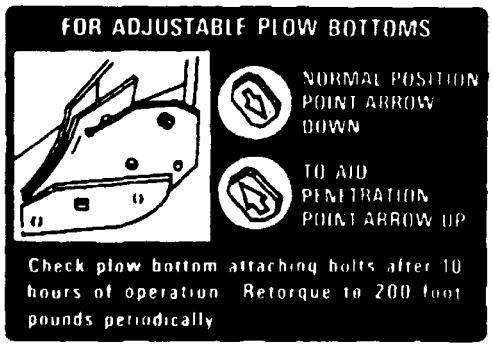
NOTE: New decals are available from your dealer.



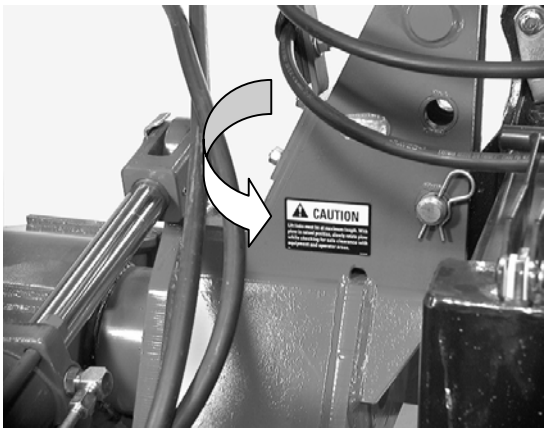

WARNING
Read the Operator's Manual. Learn to operate this machine safely. NO RIDERS. For road travel, use flashing lights and a SMV sign as required and restrict travel speed to prevent implement from swaying. Observe highway traffic regulations.
220321A1

Decal Part Number – I220321A1




FOR ADJUSTABLE PLOW BOTTOMS
NORMAL POSITION POINT ARROW DOWN
TO AID PENETRATION POINT ARROW UP
Check plow bottom attaching bolts after 10 hours of operation Retorque to 200 foot pounds periodically

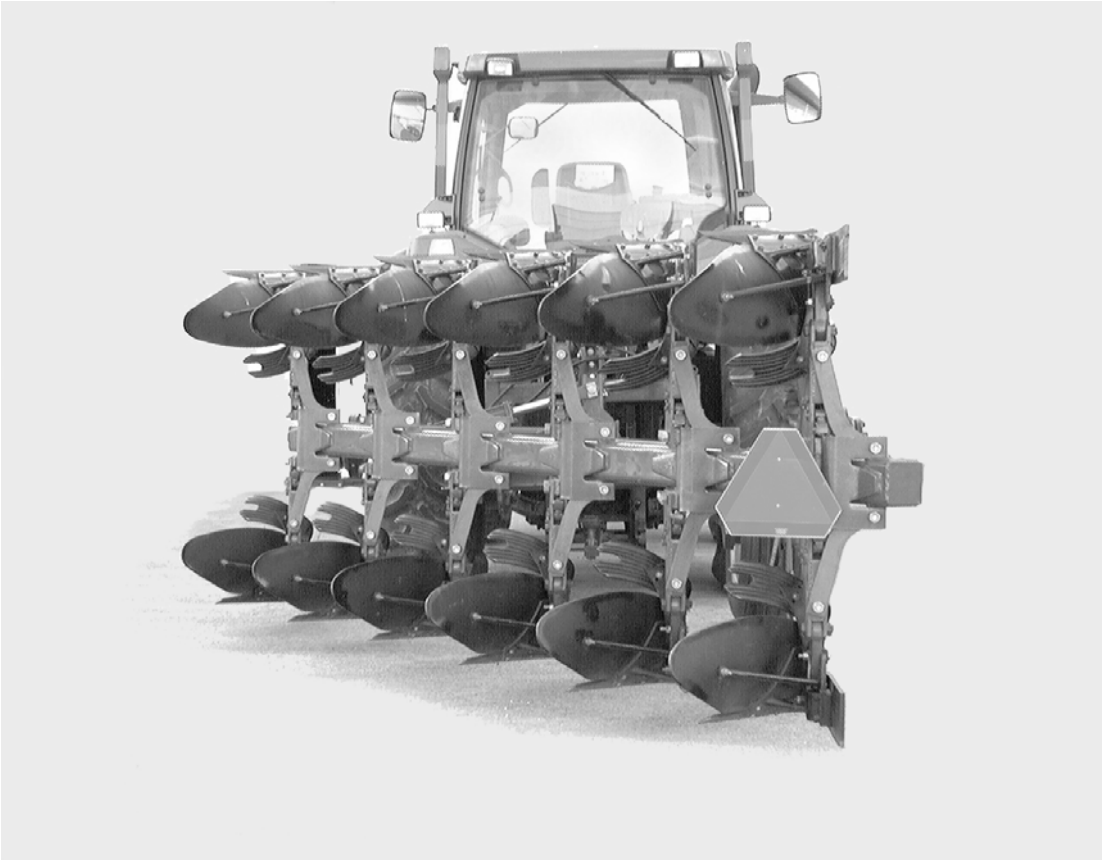
Decal Part Number – I2753186R2



CAUTION
Lift links must be at maximum length. With plow in raised position, slowly rotate plow while checking for safe clearance with equipment and operator areas.

Decal Part Number – I543301R1

SLOW MOVING VEHICLE (SMV) EMBLEM



A slow moving vehicle emblem must be ordered from your dealer and installed on your plow when transporting on roads.

The emblem mounting bracket is installed on the rear of the main frame. See Slow Moving Emblem installation instructions in this manual.

WARNING: Use warning devices (i.e. flags, SMV emblem, lights, etc.) which are approved for use by your local government agencies, when moving equipment on public roads. Keep these devices clean and in good working condition.

ENERGY CONSERVATION

FOLLOW THESE RECOMMENDATIONS

An Energy Conservation Plan is your best Insurance against waste.
Energy is Money. Don't Waste it!

An Energy Conservation Plan consists of:

1. Being sure the equipment is properly adjusted to the task being performed. Review Operators Manual thoroughly.
2. Being sure the operator is thoroughly trained in the operation of the equipment. Review Operators Manual thoroughly.
3. Being sure that proper lubrication and maintenance procedures are followed. Review Operators Manual thoroughly.
4. Matching as closely as possible the tractor size (horsepower) to the implement size and soil conditions.

ADJUSTING AND OPERATING

TRACTOR PREPARATION

Tractor Stability

Refer to the operator's manual furnished with the tractor and add sufficient front and rear weight to insure proper stability for field operation and road transport.

Tractors of other manufacture:

Add sufficient front and rear weights as recommended by them for use with rear mounted tillage equipment.

Tractor Wheel Weight

It is recommended that the tractor rear wheels carry added weight for increased traction. Adding weight saves wear on the tires and serves to stabilize the tractor for plowing on rough or hillside fields. For this purpose, liquid such as calcium chloride solution can be placed in the rear tires or one or two weights (available from your dealer) may be bolted on each rear wheel. In loose soil, it may be necessary to use both the liquid and the weights to prevent excessive tire slippage.

The mixing and filling of tires with a calcium solution can be very dangerous. This service should be performed by your dealer or local tire distributor.

Tractor Rear Wheel Settings

The recommended setting for average field conditions is approximately 32 inches (81.3 cm) for 18-inch plows and 30 inches (76.2 cm) for 16 inch plows. Measure from the center of the power take-off shaft to the inner edge of each of the rear tires.

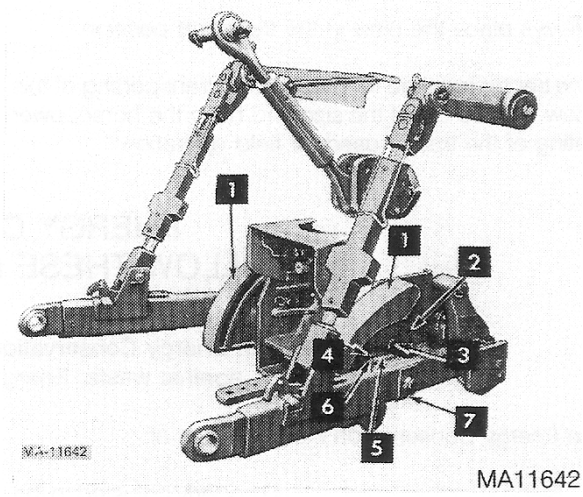
Refer to your operator's manual and to the instructions pertaining to the use of dual wheels.

Tractor Tire Inflation

The use of the proper air pressure is the most important factor in satisfactory performance and maintenance of tractor or implement tires.

Check the air pressure every two or three weeks to maintain the pressure within the recommended air pressure range.

Three-Point Hitch Adjustment With Cam Sway Limiters



1. CAM SWAY LIMITER
2. RIGID POSITION HOLE
3. HEADED PIN IN SWAY POSITION HOLE
4. CAM BUMPER
5. CATEGORY III SPACER
6. CAM BUMPER SHIMS
7. CAM BUMPER SHIMS IN STORAGE POSITION

Figure 6 - Category III Three-Point Hitch With Can Sway Limiter In Sway Position

Never operate this plow with the cams set in the extra sway position.

The illustration is of a typical tractor hitch.

The upper link should be installed in the upper hole of the tractor's attaching bracket.

Use either or both turnbuckles to level the hitch with the ground. When the groove on each leveling rod is aligned with the top edge of the turnbuckles, the lower link swivel sockets will be level with the tractor axle and at their nominal height.

Place the turnbuckle bail locks in their locked position. This prevents the turnbuckles from turning out of adjustment and prevents the bails from interfering with other parts of the tractor when the hitch is raised or lowered.

Be sure to set the swinging drawbar in its storage position (refer to tractor manual). The swinging drawbar may be removed from the tractor, if preferred.

Be certain that the lower links are set in the sway position before operation.

NOTE: *For tractors equipped with 3-point hitch and 4-position control valve. When lowering the plow for field operation, be sure to move the control lever to the full down (Float) position to prevent possible down pressure and damage to the plow.*

PLOW PREPARATION

General

When starting to plow with a new plow or a plow that has been stored, check to see that all bolts and set screws are tight and that all cotter pins are spread to keep them from falling out. It is especially important that the bolts holding the plow bottoms be tightened to a torque of 200 ft-lbs (271 Nm) and periodically maintaining 80 to 100 ft-lb (108.5 to 135.6 Nm) torque.

Removing Protective Coating From Plow Bottoms

Plow bottoms are finished and coated to prevent rusting before leaving the factory. Good field work cannot be accomplished until this coating is removed.

The black, protective coating on the plow bottoms will quickly wear away in most soils. For soils that scour with difficulty, it is recommended to remove the coating before attempting to plow. Use of a non-combustible cleaning solvent for this purpose. If necessary, use a stronger solvent such as paint remover to remove the protective coating.

If the plow is not to be used for long periods of time, scrape off the dirt. Clean and protect the polished surface of the plow bottoms with a liberal coating of a rust corrosion preventive, available from your dealer. Heavy grease can be used to protect the plow bottoms for short periods of time.

Keep work areas well ventilated when using cleaning solvents to remove the protective coating.

Plow Tire Inflation

Gauge Wheel Tire - 30 PSI (206.9 kPa) (2 bar)

Accumulator and Hydraulic Reset System

At the beginning of each season, check the nitrogen gas pressure in the accumulator and the hydraulic oil pressure in the reset system. Refer to the “Accumulator System” on page 8 for this procedure.

Transporting on the Highway

The tractor required for proper road transporting of this plow, should equal the size and have the horsepower rating of the tractor used for field operation.

When road transporting, lock brakes together, use lighting and marking devices consistent with local law enforcement agencies.

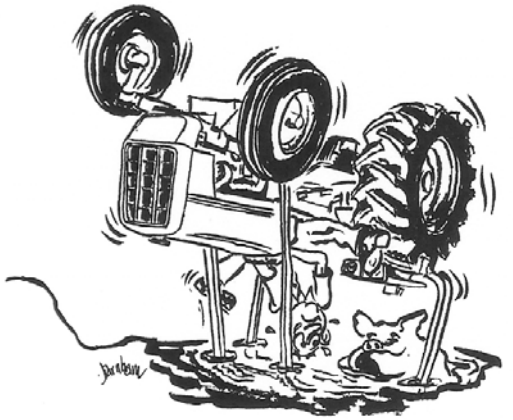
The bracket for a slow moving vehicle (SMV) emblem must be attached as near to the rear and center of the vehicle as practicable. The slow moving vehicle emblem must be in a plane perpendicular to the direction of travel (plus or minus 10 degrees) and be placed centrally at the rear of the vehicle, unobscured and two to six feet (61 to 183 cm) above the ground, measured from the lower edge of the emblem.

The SMV emblem should be used at all times while on a public road.

Drive at a reasonable speed (not in excess of 20 mph (32 km/h)) to maintain complete control of the tractor and implement at all times.

Comply with all state and local laws governing highway safety and with regulations that cover moving machinery on the highway.

Avoid tipping hazards. Spread wheels as wide as operation permits and do not drive close to ditches. Use seat belts with rops and safety enclosures.



MA16858

Figure 7 - Reasonable Speeds

TRACTOR OPERATION

Hitch Adjustment

To prevent damage to tractor cab or protective frame, both hitch links must be set to a maximum length.

After initial raising and rotating of plow, lift links may be shortened if adequate clearance to cab is available and additional transport clearance is desired.

IF THE CAB REAR WINDOW IS TO BE OPEN, care must be used to see that adequate clearance is allowed for the bottoms as the plow is rotated.

Tractor Hitch Control

Draft control is that function of the tractor hitch that responds to variation in draft and does it quick enough to maintain a nearly constant load on the tractor. When the load on the hitch increases, the hitch responds by shallowing the front end of the plow, which transfers, increased weight to the tractor thus increasing tractor. A choice of two methods of using DRAFT CONTROL is available as follows.

Position Control – Modified (Recommended)

This method is useful in fields with extreme soil variations providing all the draft control advantages. This method sets a depth limit (so that the plow will not go too deep where lighter soils are encountered).

When the plow is correctly leveled with the hitch and with the gauge wheel, it can be desirable to operate using the POSITION CONTROL – MODIFIED method.

In the above example, a bottom or depth limit is established by setting the POSITION CONTROL level while plowing in the lighter soil in the field. The load control lever is then set to establish the desired load for operating in the heavier soil in the field. The operator can determine in a short time the best settings. See the tractor operators manual.

Load Control

See the tractor operators manual.

Never part the plow in the raised position. Moving the control lever will lower the plow even though the engine is not running. If it is necessary to service the plow in the raised position, use jackstands to safety support the plow in position, also use the safety stop provided on the lift cylinder.

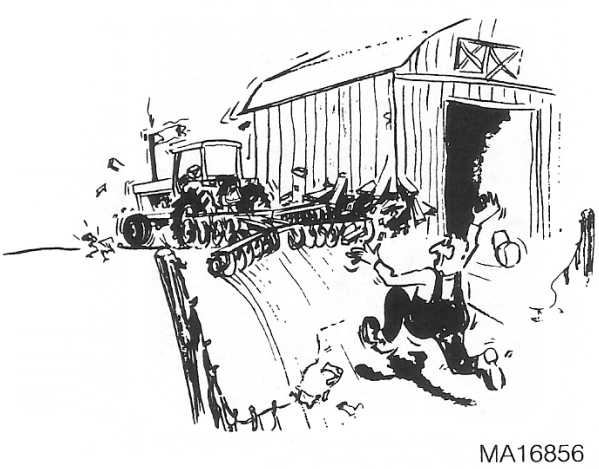


Figure 8 - Parking And Dismounting

Whenever dismounting from a vehicle stop all power sources, lower equipment to the ground, shut off engine, use park brake or lock and remove key.

NOTE: *When using implements with auxiliary hydraulic cylinders, the operator should be aware that a slow hitch response setting will affect (or lower) the pressure available to the remote hydraulic outlets.*

When lowering the implement to start operating, the inside lever should not be moved directly to the extreme forward position as this will cause slow entry of the implement.

Move the outside draft control lever forward as far as possible, to prevent any upward or downward movement of the hitch, when either hitching or unhitching the plow.

Never park the plow in the raised position. Moving the control lever will lower the plow even though the engine is not running.

NOTE: *Refer to your tractor operator's manual for more detailed data.*

PLOW OPERATION

Attaching To Tractor

Slip the lower link ball joints over the plow hitch pins and lock in place with klik pins provided.

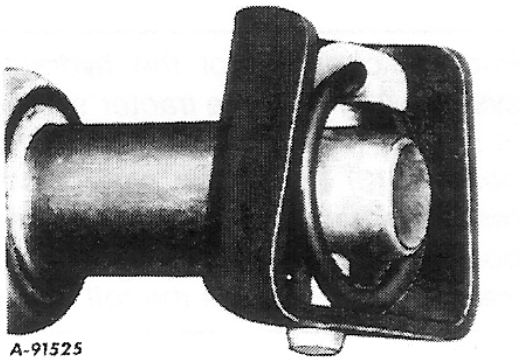


Figure 9 Klik Pin Shield

NOTE: *Use shields (located in tractor tool box) ahead of klik pins to prevent the klik pins from being dislodged from plow hitch pins.*

Adjust the hitch upper link to level the plow fore and aft. The link may be slightly lengthened for shallow plowing or shortened for deep plowing.

Accumulator System for Automatic Reset Plows

Check the Nitrogen Gas Pressure

The accumulator was pre-charged at the factory to the recommended 1450 PSI (9997.8 kPa) nitrogen gas pressure.

If it ever becomes necessary to either increase or decrease gas pressure or completely recharge the accumulator with nitrogen gas, have your dealer perform this service.

To prevent the risk of personal injury as well as possible damage to the accumulator or the hydraulic system, maintain the recommended nitrogen gas pressure.

The reset system must be charged with hydraulic oil, which provides the necessary hydraulic pressure required to hold the plow standards in a working position.

The hydraulic oil when added to the system should provide a hydraulic pressure 10 percent greater than the nitrogen gas pressure in the accumulator.

Prior to charging of the hydraulic reset system:

1. ***Place the tractor's transmission in neutral.***
2. ***Set the brakes in the locked position.***
3. ***Lower the plow allowing it to rest squarely on the plow bottoms.***
4. ***Disconnect the two hydraulic hoses from the tractor that activate the roll over cylinder.***

Performing the preceding four steps will prevent any movement of the plow during the charging cycle.

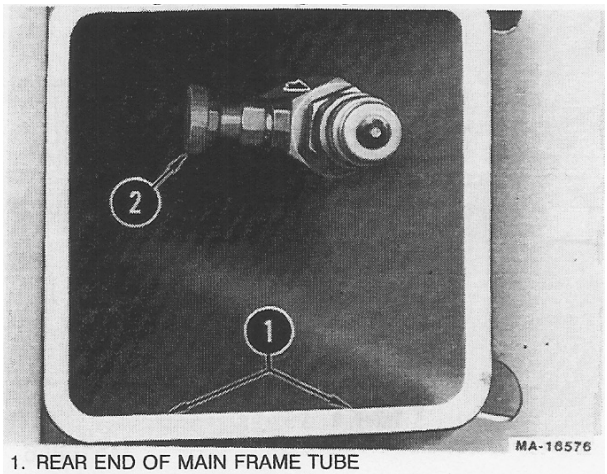
IMPORTANT: *The component parts of the plow's hydraulic reset system are free of any contaminates when the parts left the factory. Since the system is closed and contains no filter of its own, it is imperative that the hydraulic fluid coming from the tractor be free of any contaminates.*

Before charging the reset system it is recommended that the tractor's hydraulic system be cleaned by your dealer. Tractor hydraulic fluid should be circulated through an auxiliary filter for a period of approximately (20) minutes to remove any contamination.

The clean up procedure outline and a listing of the required auxiliary filter components can be found in Service Manual No. GSS-1470-1.

Contaminates circulating in a closed system, which is not being filtered, can cause extensive damage to the hydraulic cylinders.

Connecting the Charging Hose



1. REAR END OF MAIN FRAME TUBE
2. RESET SYSTEM GATE VALVE

Figure 10 - Charging Hose Connection

Connect male end of the charging hose to one of the tractor's remote cylinder breakaway couplers. Connect the other end of the hose to the male coupler of the "Reset System", located in the rear end of the main frame tube. Refer to illustration.

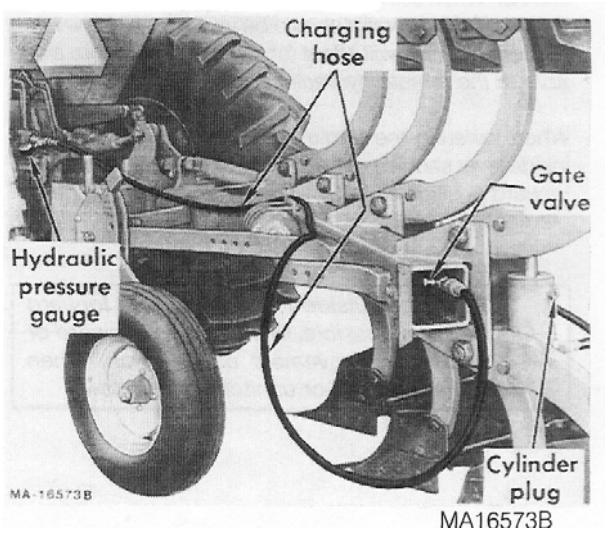


Figure 11 - Charging Hose Routing

Charging the Hydraulic Reset System

When charging the reset system with hydraulic oil for the first time or if the system has been drained for repairs, proceed as follows:

Be sure the plug located in the port on the rod end of each cylinder is tight.

Open the gate valve in the plow's reset system, which is located in the rear of the main frame tube.

Set the tractor's engine speed to approximately half throttle. Slowly activate the control lever of the remote coupler selected for charging. Move the control lever in a direction that fully extends the reset cylinders, and then move the lever in the reverse direction to fully retract all cylinders. Repeat this procedure several times to completely bleed the system of all air.

With the charging hose pressure gauge reading at zero, close the reset system gate valve. Slowly activate the remote cylinder operating lever until the pressure gauge registers a reading of 10 percent greater than the nitrogen gas pressure in the accumulator.

Example: With accumulator at the recommended 1450 PSI (9997.8 kPa) nitrogen gas pressure, apply hydraulic pressure until the gauge registers approximately 1600 PSI (11032 kPa) oil pressure.

When the desired oil pressure is reached, reverse the operating lever to relieve the pressure in the charging hose. Disconnect the charging hose from the tractor and the plow and store it. NEVER operate the plow with the charging hose connected.

A one-way oil check is incorporated in the reset system's gate valve, which makes it unnecessary to open the gate valve for any reason other than to check or reduce oil pressure or to relieve the entire system for repairs.

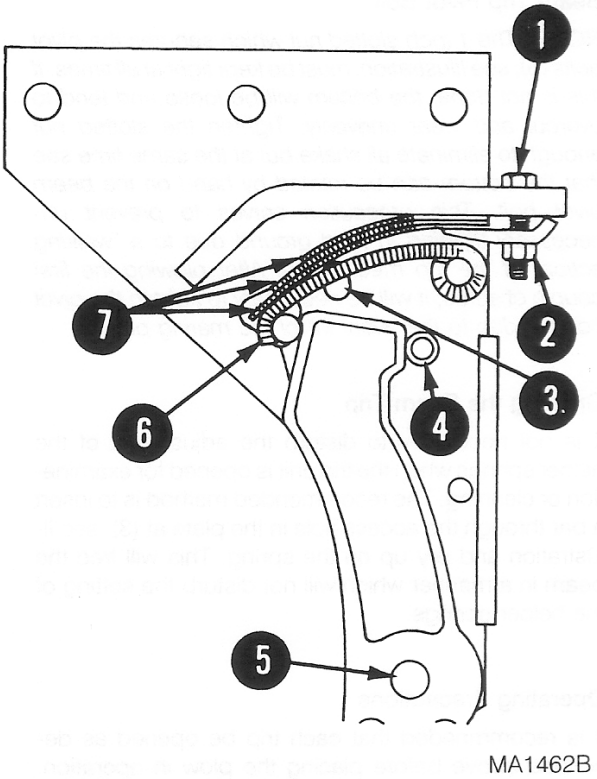
To check the oil pressure in the plow's reset system, connect the charging hose as previously instructed under "Connecting the Charging Hose". Then open the gate valve and check the reading on the pressure gauge.

NOTE: *Occasionally a small amount of oil ma seep by the one way check in the gate valve and prevent the ball in the male coupler from depressing, when the charging hose is attached.*

As a result, no pressure will register on the gauge even though it is apparent that some pressure is still present in the system.

Should this occur, close the gate valve and recharge the system as previously explained.

Spring Trip Beam



1. ADJUSTING BOLT
2. LOCK NUT
3. ACCESS HOLE
4. BEAM STOP
5. PIVOT BOLT
6. MAIN SPRING
7. HELPER SPRINGS

Figure 12 - Spring Trip Beam

The beam trips are factory set for average soil condition. This setting is slightly higher than the minimum load limit.

Should conditions require an increase in the trip load, tighten either the adjusting bolt at (1) or the nut at (2) while holding the opposite end with a second wrench. Tighten the adjusting bolt and nut until the frequency of tripping does not handicap the plowing operation.

Tighten the adjusting bolt and nut increased the load limit and reduces the frequency of tripping in hard ground, alfalfa, etc. but will at the same time increase the possibility of bottom damage.

Loosening the same adjusting bolt and nut reduces the load limit and may increase the tripping action but will minimize bottom damage.

Beam trip Pivot Bolt

NOTE: *The 1 inch slotted nut which secures the pivot bolts (5), see illustration, must be kept tight at all times. If this is not done, the bottom will be loose and tend to overcut and wear unevenly. Tighten the slotted nut enough to eliminate all shake but at the same time see that the bottom can be rotated by hand on the beam pivot bolt. This precaution serves to prevent unnecessary tripping in hard ground due to a "walking action" of the trip mechanism. After plowing the first couple of acres, it will be necessary to tighten the pivot bolt nut due to the "wear in" o the mating parts.*

Opening the Beam Trip

It is not necessary to disturb the adjustment of the helper springs when the trip unit is opened for examination or cleaning. The recommended method is to insert a bar through the access hole in the plate at (3), see illustration and pry up on the spring. This will free the beam in a manner that will not disturb the setting of the helper springs.

Operating Precautions

It is recommended that each trip be opened as described above before placing the plow in operation. Remove any accumulation of dried paint but do not lubricate the spring, notch or roller. Do this again at the beginning of each plowing season and remove any dirt or rust, which may interfere with operation. Open and close the unit several times to check the trip action.

Leveling the Bottoms

After a furrow is opened across the field at the desired depth, operate the plow in the usual manner with the tractor rear wheel in the furrow. Before proceeding with the leveling adjustment, make sure the lift links are the same length and the lower links are level as described in "Hitch Adjustment" in this manual. Now, with the bottoms operating at the same depth as the previous pass across the field, check to see that the bottoms are level. The furrow bottom should be level and the plow beam should be vertical to the ground. Note that it is better to have the wing of the share a little high than too low.

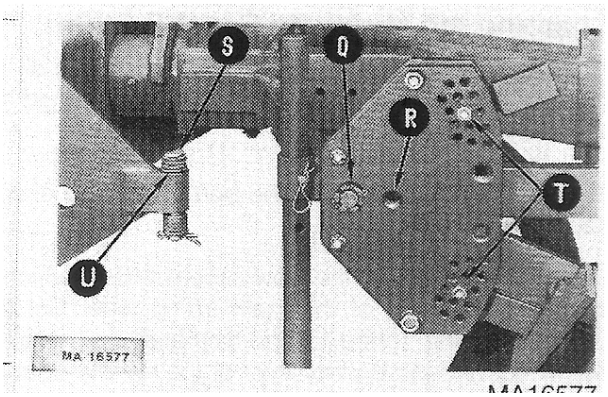


Figure 13 - Bottoms Leveling

Leveling is accomplished by adding or removing spacers under the head of the pin as shown at “S” in the illustration, located on each side of the front frame. The largest (1-¾ inch diameter hardened steel) spacer on either side as shown at “U” should be kept in this position against the frame at all times. Smaller spacers (if required) should be inserted between the head of the pin and the large spacer.

Never remove all the spacers from the bottom of the pin, always leave at least one as a cotter pin retainer.

When the bottoms being used are properly leveled, make the same adjustment for the opposite bottoms. Identical setting may be made by counting the spacers under pin head.

Do not use the hitch turn buckles for leveling the plow.

Gauge Wheel

When making a change in plowing depth, it is necessary to consider the gauge wheel setting along with the hitch setting. The gauge wheel should carry appreciable weight; however, if it makes a deep track in the ground and the plowing depth is satisfactory, then the setting should be raised slightly. The hitch setting will determine the plowing depth while the gauge wheel serves to stabilize the selected depth and keep the plow frame level with the ground. Too much weight on the wheel will cause unnecessary wear on the wheel bearing.

The gauge wheel serves equally for right and left turning bottoms and stops are provided to stabilize the depth in each instance. The adjusting bolts “T” in the illustration locate the stops according to the desired depth. Set the stops for both sides at the same setting.

The gauge wheel pivot is illustrated in the forward position at “Q” which is normal for most applications.

If shallower plowing is desired, move the gauge wheel pivot to the hole location at “R”.

Rear Landside Adjustment (Optional)

Should the plow tail too far toward the unplowed ground or the tractor front tires pull toward the furrow, add one, two, or three spacers as required between landside and brace at “E” until plow runs straight behind the tractor.

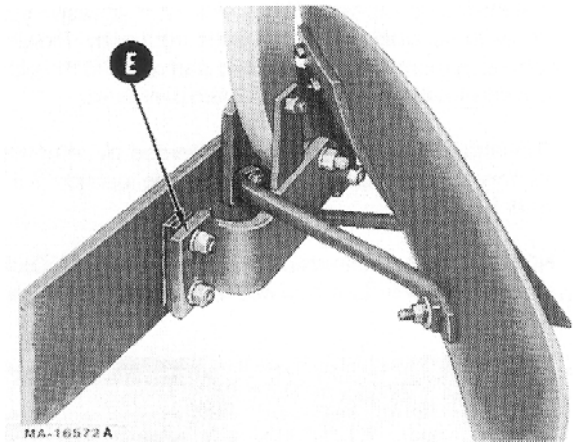


Figure 14 - Installation of Rear Landside Spacers

Air Filters (No Longer Required)

The cylinder plug should always be kept tight to prevent contaminants from entering the system. It also prevents the loss of any hydraulic fluid.

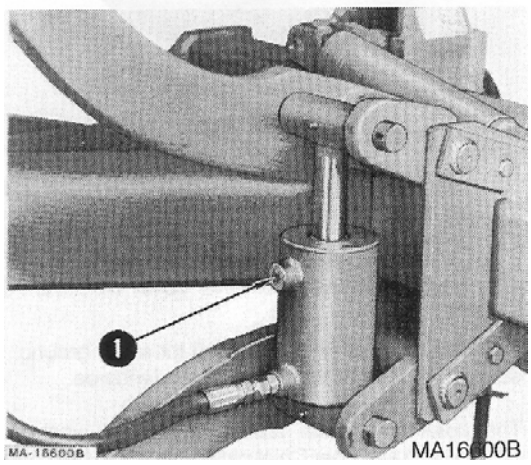
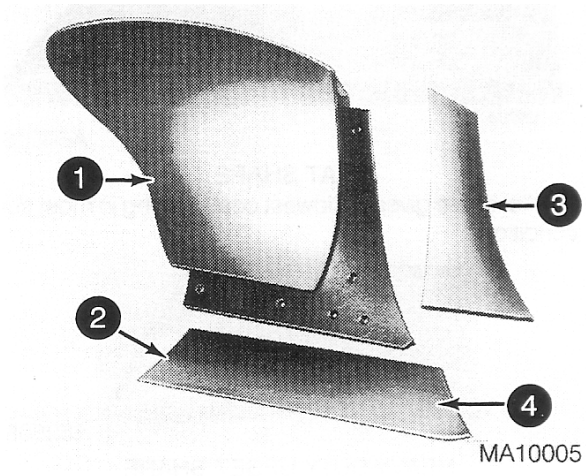


Figure 15 - Cylinder Plug Location

Plow Bottom



1. MOLDBOARD
2. SOLID STEEL, THROW AWAY SHARE
3. REPLACEABLE SHIN
4. RUGGED WELDED STEEL FROG

Figure 16 - Plow Bottom Components

Super Chief ® Bottom

The replaceable shin, landside, and share provide a quick and economical means for renewing the points that have maximum wear. The shares are the throw away type designed for replacement instead of sharpening or renewal. Shares are available in regular, upset and deep-suck styles.

Scouring

If the plow bottoms do not scour immediately, it is because the soil is rather sticky and you will have to wait until the bottoms have taken a land polish. This may require a few rounds or in very sticky soil, a few days. To obtain this land polish, it is recommended that you run the plow rather shallow and fast. It is also advisable to set the colters far to the outside of the landside and not too deep. Sometimes it is necessary to remove the colters entirely to obtain the maximum pressure on the plow bottom, which aids in scouring.

Flat Share

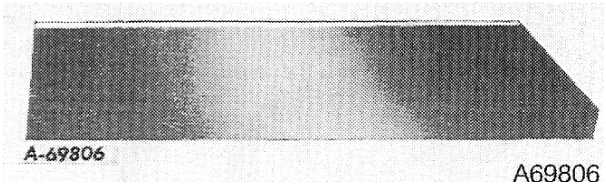


Figure 17 - Flat Share

The flat share gives the lowest cost plowing in the most soil conditions.

Heavy-Duty Upset Share

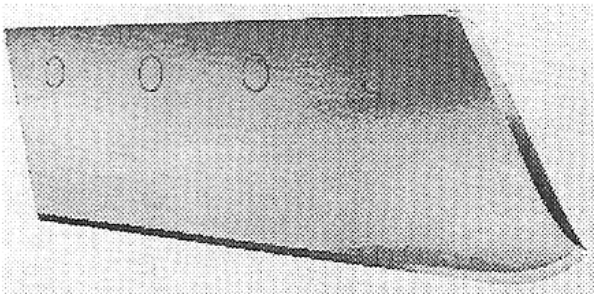


Figure 18 - Heavy-Duty Upset Share

The heavy-duty upset share has thickness throughout the whole front portion for added strength when used in rocky conditions and for more wear in extremely abrasive soil.

Deep Suck Share

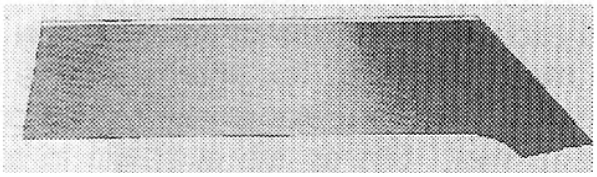


Figure 19 - Deep Suck Share

The deep suck share has a point designed for more aggressive action, giving quicker entry and more stable plowing depths in hard ground. This style of share, as well as the heavy-duty upset share are available with hard surfacing. Note however, that hard surfacing is not recommended for rocky conditions.

All shares are interchangeable. The bottoms can be changed from regular cut to undercut or overcut, depending on the size of shares used.

Shares, shins, and landsides are held to the frog by plow bolts. When replacing these parts, be sure the bolts are tightened securely. After plowing for a while, raise the plow bottoms and tighten the bolts that are loose.

NOTE: *The plow share bolts have left hand threads.*

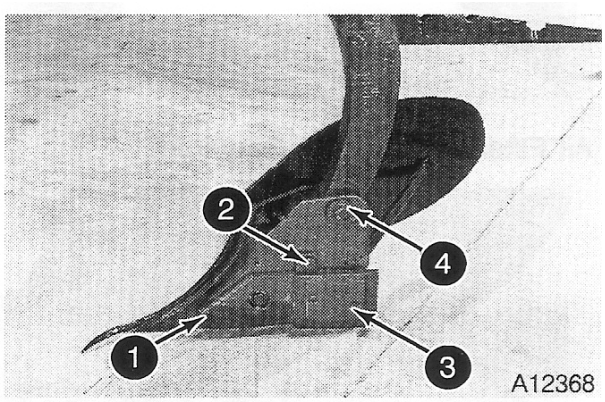
Special attention should be given to the three 5/8 inch bolts that attach the plow bottoms to the beams. These bolts must be checked periodically to maintain a torque of 200 ft-lb (271.2 Nm).

Never let the plow share, shin or landside show wear so the frog is exposed. When plowing in abrasive soil, check the condition of these parts frequently. Plowing with worn, bent or broken

shares can result in the plow working inefficiently and increased fuel costs.

The landside wear pad can be reversed by removing the two attaching bolts and installing the top side of the wear pad down.

NOTE: *A twin pad landside is available from your local dealer. This will reduce pad wear and stop the plow from over cutting.*



1. LANDSIDE
2. STOP BLOCK
3. WEAR PAD (REVERSIBLE)
4. ECCENTRIC WASHER POINTING DOWN (NORMAL POSITION)

Figure 20 - Landside Wear Pad And Stop Block

The stop block is recommended for rocky ground. Be sure the block fits tight against the landside.

The adjustable pitch feature (eccentric washer) is provided on all Super Chief plow bottoms to help penetration with worn shares thereby increasing the life of a share. This feature also provides more suck for additional penetration when required.

Caution must be taken to see that this feature is used correctly. When new shares are being used, the plow bottom must be set in the normal position.

COLTER ADJUSTMENT

A set collar is located in the colter yoke to prevent the colter from winging completely around. This set collar must be set on the colter shank so that it will let the colter swing approximately the same distance on each side of the point of the share. The colter can then pivot when the plow is turned to the right or left. All colters must be set at the same height.

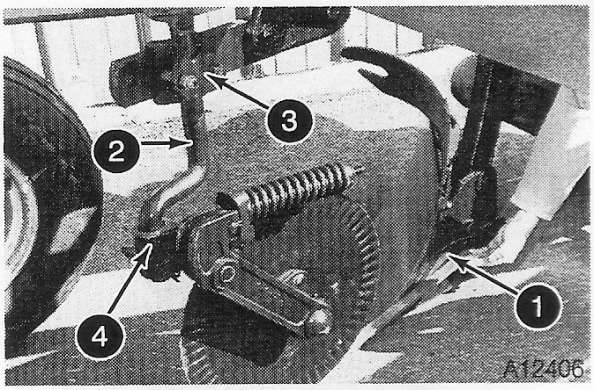
Do not run the colters too deep in hard ground, as this will ride the plow out of the ground. Loosen the colter shank clamps and turn the shank with a wrench to swing the colter so that the blade will run approximately ½ to ¾ inch from the left side of the landside for average soil conditions. Make sure that the colter blade is parallel with the landside when the measurement is made. In soft, crumbly ground, a wider setting is necessary in order to get a clean furrow wall. In sod or firmer soil, the colters can sometimes be set narrower.

An adjustment is provided to locate the colters in a fore and aft relation to the share point. The clamps holding the colter shanks to the frame rails can be used in either of the two positions. If a severe scouring plow bottom is encountered, raise the colter to maximum height. This will increase pressure on the moldboard.

The clamps holding the colter shanks to the frame rails on the High Speed European Style (HSES) bottoms must be used on the front hole position. The clamps holding the colter shanks to the frame rails on the super chief bottoms must be used in the rear hole positions.

Cushion Spring Colter (Optional)

Cushion springs colters are especially recommended for use with automatic trip beams and rocky soil. These colters must be set lower to provide for spring deflection. Tighten the adjustment nut on the spring rod if a greater amount of down pressure is desired.



1. 1/2 TO 3/4 INCH
2. SHANK
3. SHANK CLAMP
4. SET COLLAR

Figure 21 - Colter Cushion Spring Components

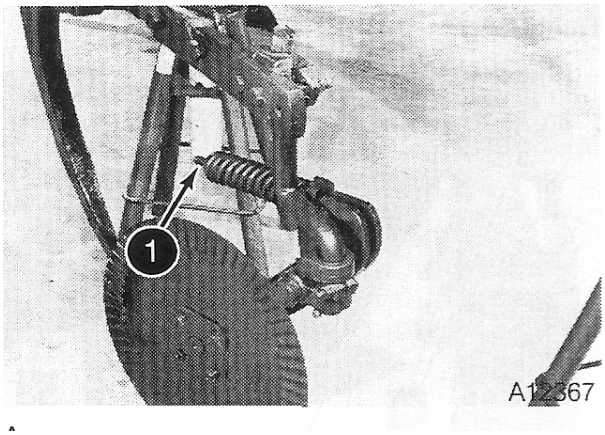


Figure 22 - Adjustment Nut

Rolling Colter (Optional)

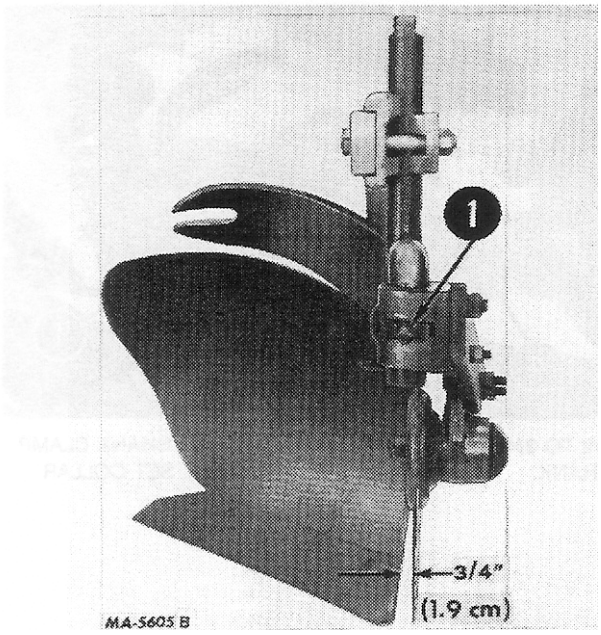


Figure 23 - Rolling Colter

Do not run the colters too deep in hard ground, as this will ride the plow out of the ground. Slightly loosen the colter shank clamp and turn the shank with a wrench to swing the colter so the blade will run approximately ¾ inch (1.9 cm) form the left side of the landside for average soil conditions. See that the colter blade is parallel with the landside when the measurement is made. In soft, crumbly ground, a wider setting is necessary in order to obtain a clean furrow wall: in sod or firmer soil, the colters can sometimes be set narrower.

A set collar at (1), (See illustration) is provided in the colter yoke to prevent the colter from swinging completely around.

Front Colters

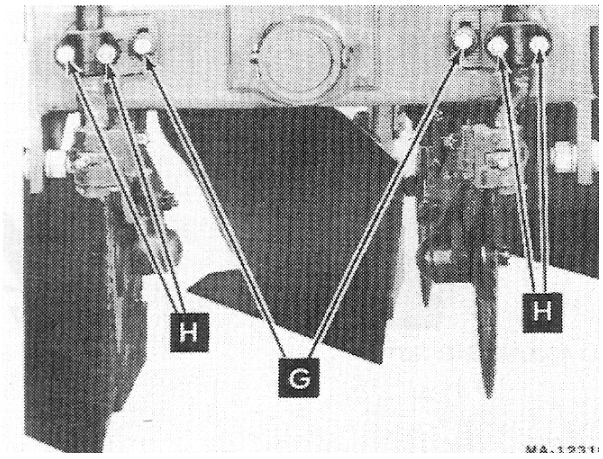


Figure 24 - Front Colter Adjustment Components

The correct operating position for the front colter is best obtained with the plow in the desired operating position. Loosen the bolt “G” in the clamp slot and swing the colter toward the point of the bottom until it sets in the vertical position.

With the collar in the vertical operating position, loosen the clamp bolts “H”, swing the shank to locate the colter ¾ inch (20 cm) out from the landside, adjust the colter up or down as desired and then retighten these bolts.

After adjusting the colter from the side that is plowing, make the same adjustments on the colter fro the other side.

Before Operating the Plow

Before beginning to operate, refer to the operator’s manual furnished with the tractor and check the function of the hydraulic control levers found to the right of the tractor seat.

Roll-Over Action

Use care when initially raising and rotating the plow. The lift links should be set short enough to allow sufficient ground clearance for proper plow rotation.

To rotate the plow for each successive pass across the field, raise the plow, then operate the hydraulic roll-over control lever as far as it will go and then release it (Note that the valve lever may be equipped with a float lockout screw and in this case, refer to the tractor operator’s manual and lock this lever out of the “float” position as shown therein). When the hydraulic cylinder is collapsed, the plow will have rotated more than half way, immediately move the control lever in the opposite

direction as far as it will go and release it. The plow will now rotate to the proper operating position and the control lever will automatically return to the neutral position.

If on three furrow plows, the roll-over action is too slow or fails to reach the mid-pint, remove the flow restrictor in the hydraulic line and replace the union (Part No. I4410204) available at your dealer. See illustration on page 17.

Stand clear of the plow while it is being operated.

Disconnecting Plow From Tractor

Select a level floor or solid level ground. Before lowering the plow, install the parking stand as shown in illustration at “A”, then lower the plow until its entire weight rests evenly on all the bottoms.

The parking stand must be used at all times, while the plow is not connected to the tractor.

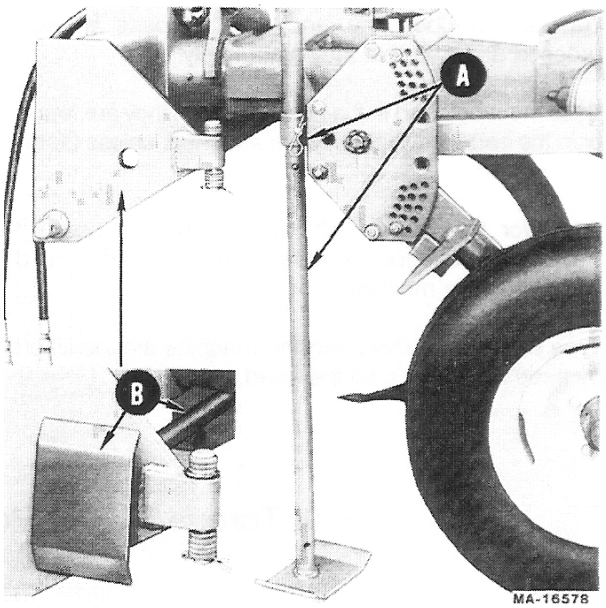


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Figure 25 - Parking Stand

When the plow is connected to the tractor and ready for operating or just before transporting, the parking stand should be placed in the storage position, which is in the hitch frame as shown in illustration at “B”.

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SETTING UP

Remove all wires and arrange the parts conveniently.

Always wear safety glasses or goggles and be careful when cutting wires and steel bands as they are under tension and will spring back when cut.

Lubricate all bearings and moving parts as you proceed and see that they work freely.

Bolts must be used in the holes in which they are found or in the parts to which they are attached, unless otherwise shown.

Wherever the terms “Left” and “Right” are used, it should be understood to mean from a position behind and facing the machine.

Type 5 bolts furnished with the machine are identified by three radial lines on the head.

Type 8 bolts furnished with the machine are identified by six radial lines on the head.

Bolts without radial lines are type one bolts.

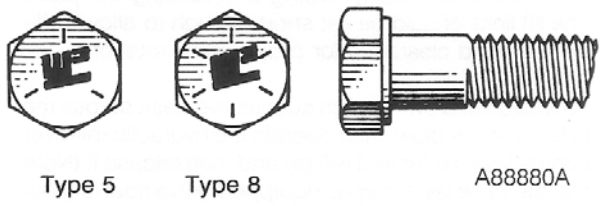


Figure 26 - Bolt Types

When tightening bolts, they should be torqued to the proper number of foot-pounds (ft-lb) or Newton Meters (Nm.) as indicated in the table unless otherwise specified.

When beginning to assemble the plow, it is recommended that the plow frame be laid over supports about 34 inches (86.4 cm) high until the hitch and wheels are installed.

Bolt Diameter Inches	Type 1		Type 5		Type 8	
	Foot Pounds	(Nm)	Foot Pounds	(Nm)	Foot Pounds	(Nm)
1/4	6	8	10	14	13	18
5/16	13	18	20	27	29	39
3/8	23	31	35	47	48	65
7/16	37	50	57	77	80	108
1/2	55	75	85	115	123	167
3/4	185	251	305	414	415	567
5/8	104	141	170	230	235	319
7/8	315	427	445	603	690	936
1	445	603	670	908	1050	1424

Table 1 - Bolt Torque Data

INSTALL HITCH PINS, HYDRAULIC ROLL-OVER CYLINDER HYDRAULIC HOSES AND SMV BRACKET

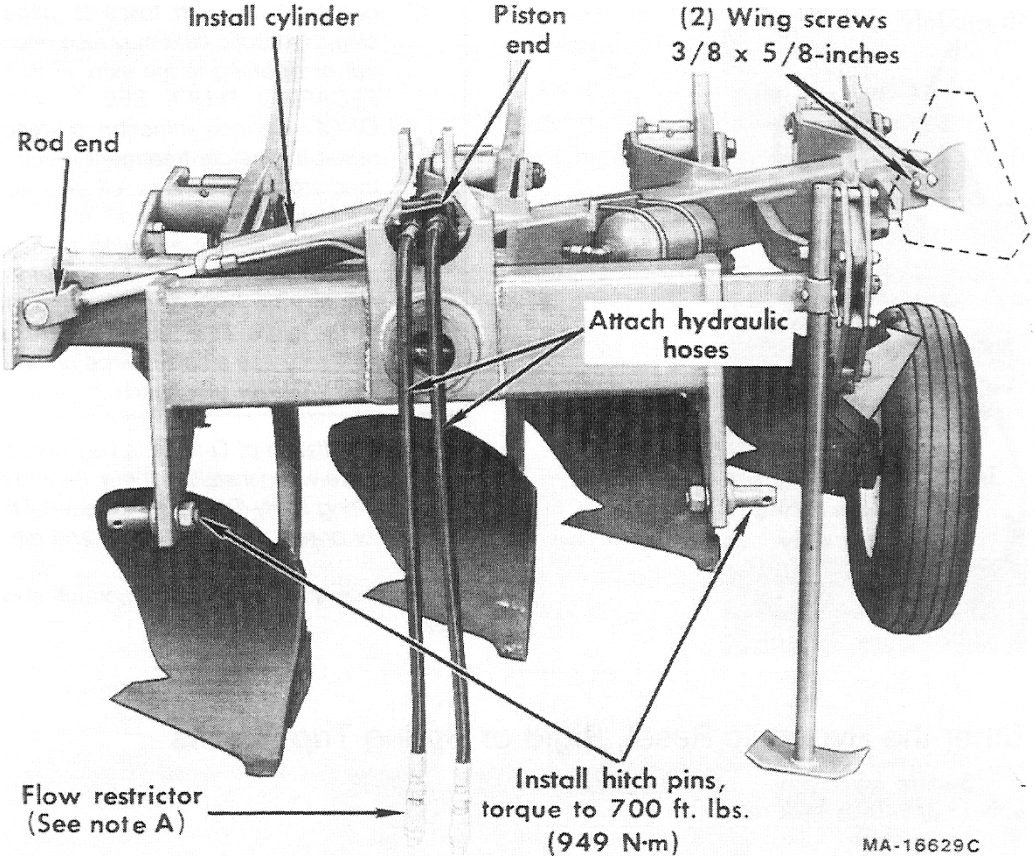


Figure 27 - Four Furrow Hydraulic Reset Trip Shown

NOTE A: *Attach flow restrictor so flare matches the flare in fitting on end of hose. Flow restrictor must be inserted in the hose attached to the piston end of the cylinder.*

NOTE: *Raise the complete roll-over frame and attach it to the tractor hitch. Utilize the hitch to hold the frame in the best position for assembling the plow.*

Securing Roll-Over Cylinder

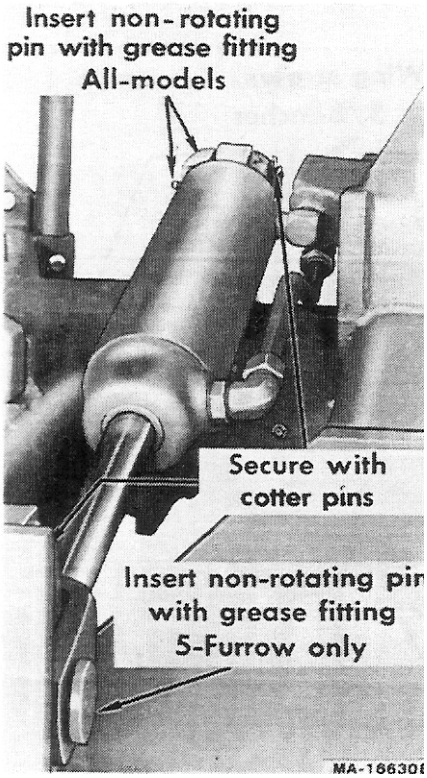

Insert non-rotating pin with grease fitting All-models
Secure with cotter pins
Insert non-rotating pin with grease fitting 5-Furrow only

Figure 28 - Roll-Over Cylinder

Hydraulic fluid may also infect a minor cut or opening in the skin. IF INJURED BY ESCAPING FLUID, SEE A DOCTOR AT ONCE. Serious infection or reaction can result in medical treatment is not given immediately. Make sure all connections are tight and that hoses and lines are in good condition before applying pressure to the system. Relieve all pressure before disconnecting the lines or performing other work on the hydraulic system. To find a leak under pressure use a small piece of cardboard or wood. Never use hands.

NOTE: *Installation of O-rings is very critical; therefore exercise care when installing them. Prior to installation, dip the O-Ring in Hy-Tran fluid. Be careful that the ring grooves or bores are free of chips and dirt.*

O-rings that show a defect or scratch should not be used.

Install Either the Hydraulic Reset, Rigid or Spring Trip Beams

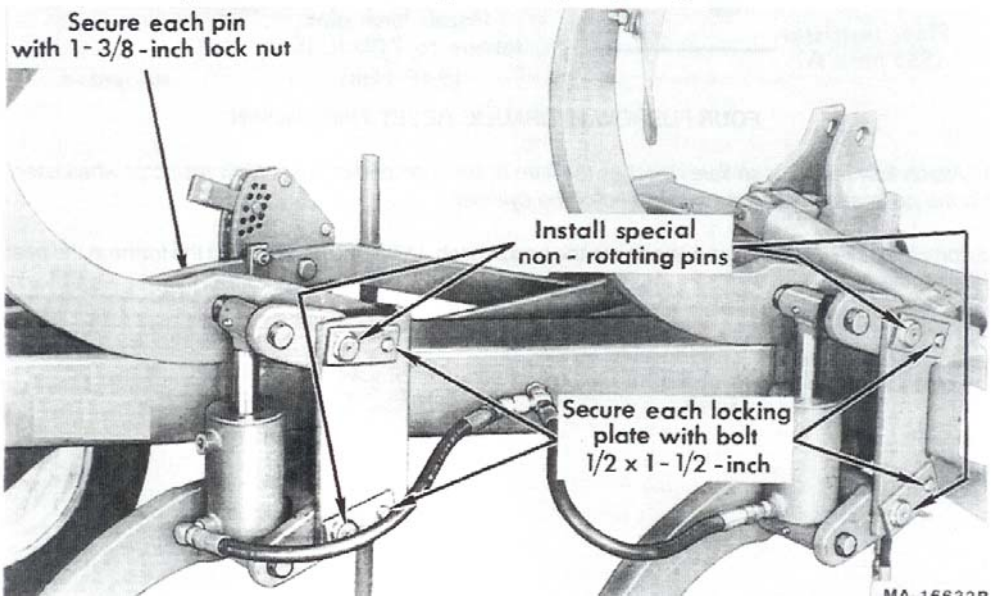
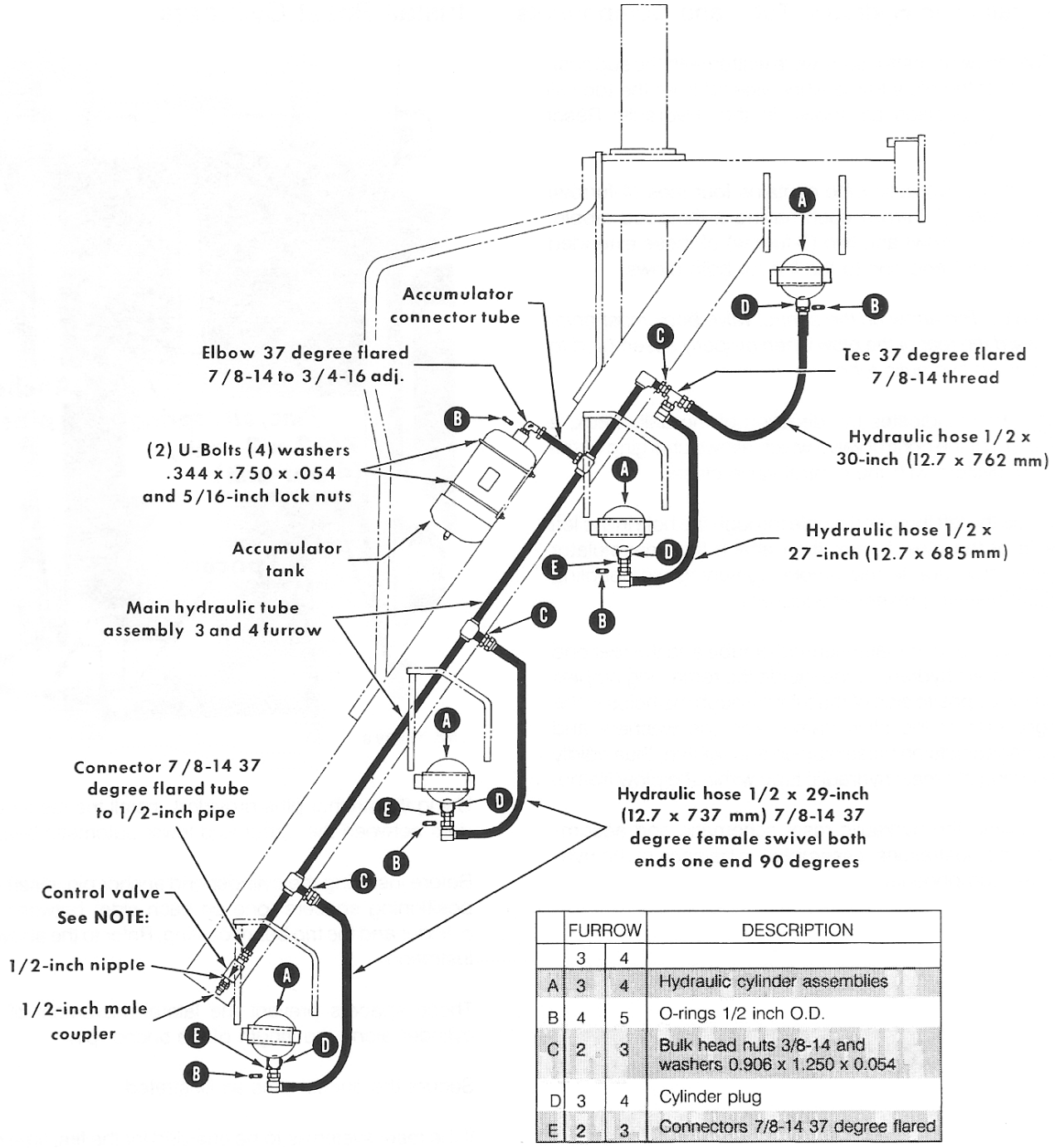

Secure each pin with 1-3/8-inch lock nut
Install special non-rotating pins
Secure each locking plate with bolt 1/2 x 1-1/2-inch

Figure 29 - Hydraulic Reset Beams


Accumulator connector tube
Elbow 37 degree flared 7/8-14 to 3/4-16 adj.
Tee 37 degree flared 7/8-14 thread
(2) U-Bolts (4) washers .344 x .750 x .054 and 5/16-inch lock nuts
Hydraulic hose 1/2 x 30-inch (12.7 x 762 mm)
Accumulator tank
Hydraulic hose 1/2 x 27-inch (12.7 x 685 mm)
Main hydraulic tube assembly 3 and 4 furrow
Connector 7/8-14 37 degree flared tube to 1/2-inch pipe
Hydraulic hose 1/2 x 29-inch (12.7 x 737 mm) 7/8-14 37 degree female swivel both ends one end 90 degrees
Control valve See NOTE:
1/2-inch nipple
1/2-inch male coupler

	FURROW		DESCRIPTION
	3	4	
A	3	4	Hydraulic cylinder assemblies
B	4	5	O-rings 1/2 inch O.D.
C	2	3	Bulk head nuts 3/8-14 and washers 0.906 x 1.250 x 0.054
D	3	4	Cylinder plug
E	2	3	Connectors 7/8-14 37 degree flared

Figure 30 - Hydraulic Hose Routing

Install Main Hydraulic Tube and Components

The following instructions were written with the supposition that the plow frame when viewed from the top will be in a position as shown in the "Hydraulic reset Schematic".

The main hydraulic tube contains four tees (4-furrow) three tees (3-furrow) each having a threaded nipple. Three (4-furrow) and two (3-furrow) of these extended to the right and one to the left for both plows.

NOTE: *The arrow on the control valve body must point toward the rear of the plow when properly assembled to the main hydraulic tube.*

The arrow indicates the direction of the ball check, a feature of the control valve that allows charging of the reset system with the control valve closed.

Guide the left threaded nipple through the hole in the left side of the plow frame; then attach the accumulator connector tube to this nipple, tightening the coupling sufficiently to prevent any leakage.

Using the accumulator connector tube and the rear end of the main hydraulic tube, guide the remaining nipples on the opposite side of the tube through the holes in the right side of the plow frame. Add the washers and bulkhead nuts on these nipples and tighten, thus rigidly securing the main hydraulic tube with the plow frame.

Following the hydraulic reset schematic and accompanying illustrations, assembly the balance of the hydraulic components.

.

Install Reset Cylinders

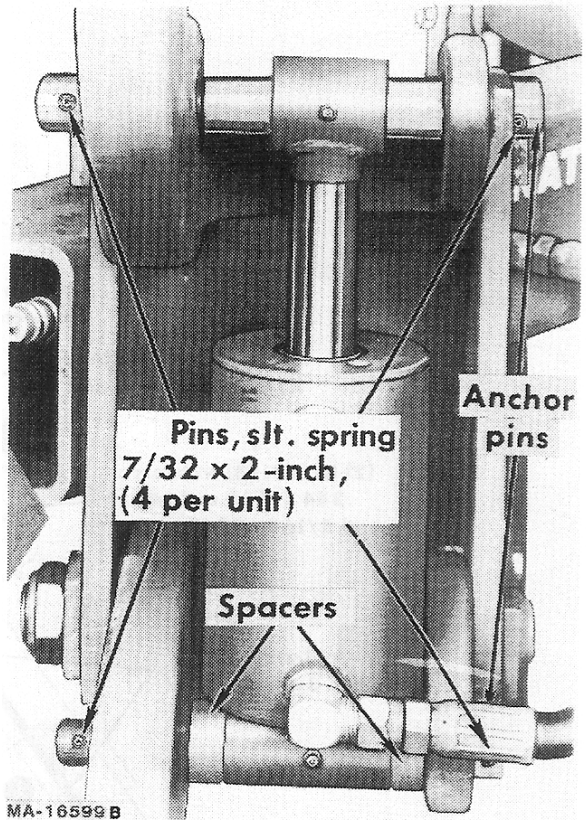


Figure 31 - Reset Cylinder

Using the anchor pins provided, install the reset cylinders between the upper and lower automatic beams.

Before installing the cylinder end anchor pin, insert two positioning spacers (one on each side) between the cylinder and the trip beam casting. Refer to the above illustration.

These spacers prevent the lateral movement of the cylinder along the length of the anchor pin.

Secure the anchor pins as illustrated.

If the reset system is to be charged fro the first time or if it is necessary to recharge the system, refer to "Charging the Reset System" in the adjusting and Operating section of this manual

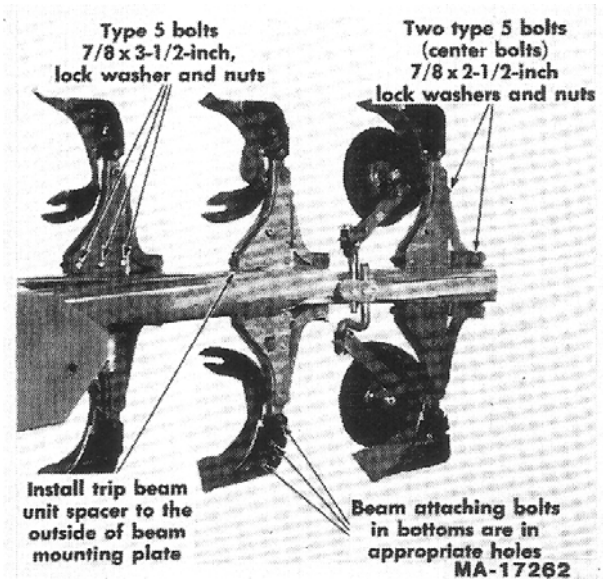


Figure 32 - Spring Trip Beams

Install Gauge Wheel

Figure 33 - Three And Four Furrow Rigid And Spring Trip Plows

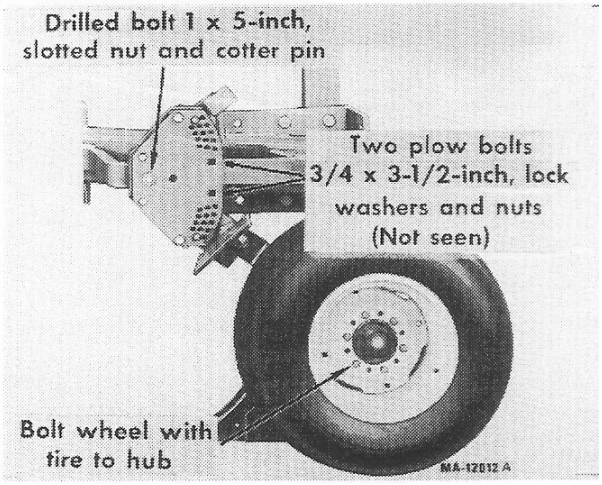


Figure 34 - Three And Four Furrow Hydraulic Reset And Five Furrow Rigid Plows

1. Attach the gauge wheel bracket to the frame rail.
2. Bolt the wheel to the hub.

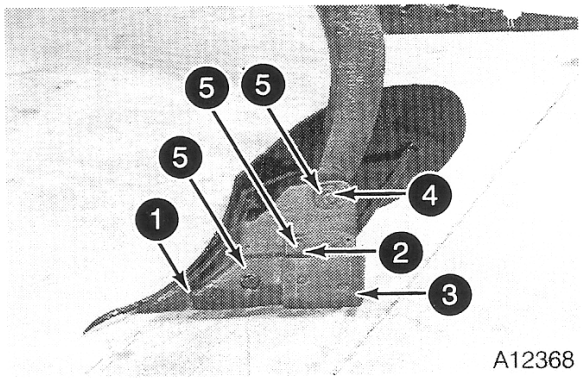
Refer to “Gauge Wheel” in Adjusting and Operating.

Bolt Bottoms to Beams

Special attention must be given to the three 5/8 inch bolts that attach the plow bottoms to the beams.

These bolts must be checked periodically to maintain a torque of 200 ft-lb (271.2 Nm).

The stop block is recommended for rocky ground. Make sure that the block fits tight against the landside.



1. LANDSIDE
2. STOP BLOCK
3. WEAR PAD (REVERSIBLE)
4. ECCENTRIC WASHER POINTING DOWN (NORMAL POSITION)
5. BOLT - 5/8 INCH DIAMETER

Figure 35 - Bolt Bottom Components

The adjustable pitch feature (eccentric washer) is provided on all super chief plow bottoms to help penetration with worn shares thereby increasing the life of the share. This feature also provides more suck for additional penetration when required. Caution must be taken to see that this feature is used correctly. When new shares are being used, the plow bottom must be set in the normal position.

Attach Rear Adjustable Landsides (Optional)

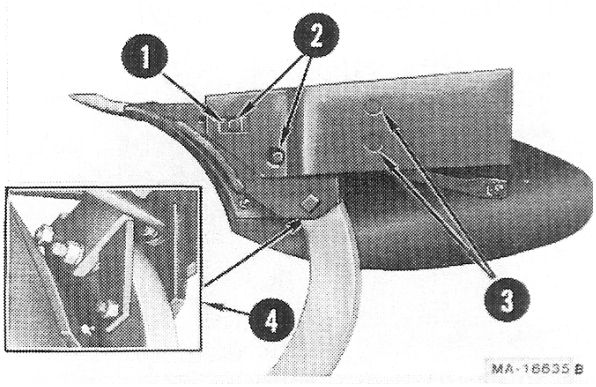


Figure 36 - Optional Read Adjustable Landsides

1. Trip beam Only

   Use (2) flat washers provided between plow beam and inner brace.

   Hydraulic Reset Beam Only

   Use block from center plow bottom attaching bolt between plow beam and inner brace.

2. Type 8 bolts, 5/8 x 3-½ inch, lock washers and nuts.
3. No. 3 plow bolt 5/8 x 3 inch, lock washers and nuts.
4. Install gusset shown in inset. Also refer to illustration “Rear Landside Adjustment” in “Adjusting and Operating”

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OPTIONAL EQUIPMENT

INSTALL MOUNTING PLATES – HYDRAULIC RESET PLOWS ONLY

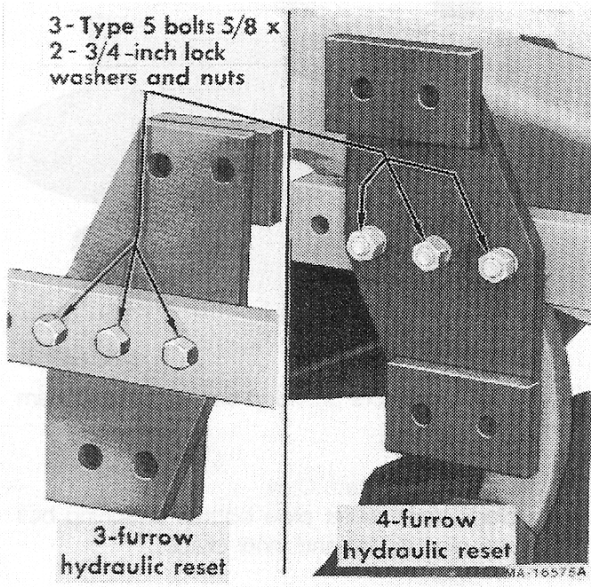

Figure 37 - Installation of Mounting Plates

INSTALL CUSHION SPRINGS COLTERS FOR HYDRAULIC RESET PLOWS ONLY

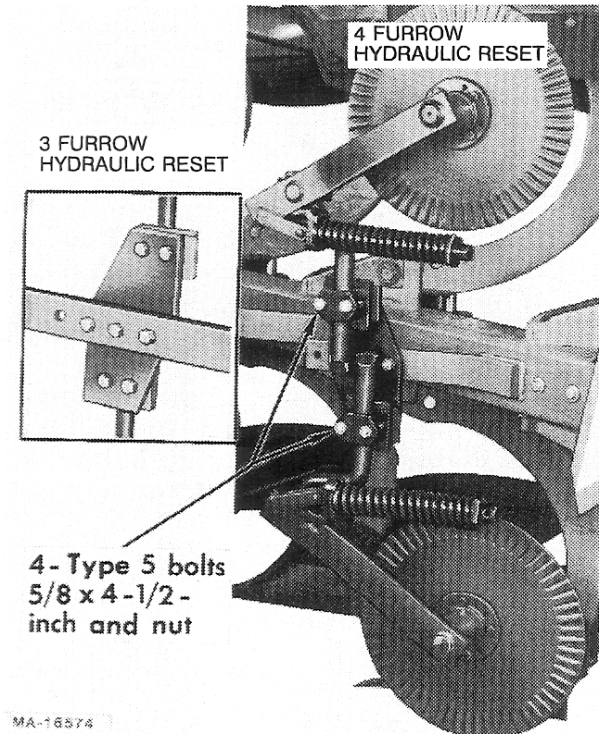

Figure 38 - Welded Style Shown

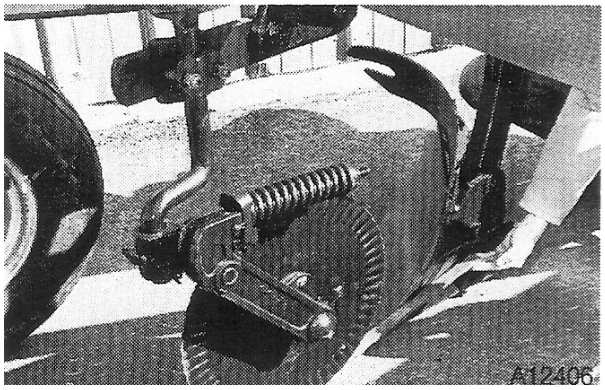

Figure 39 - Cast Arm Style Shown

INSTALL RIDGID SHANK COLTERS FOR RIGID BEAM OR SPRING TRIP PLOWS

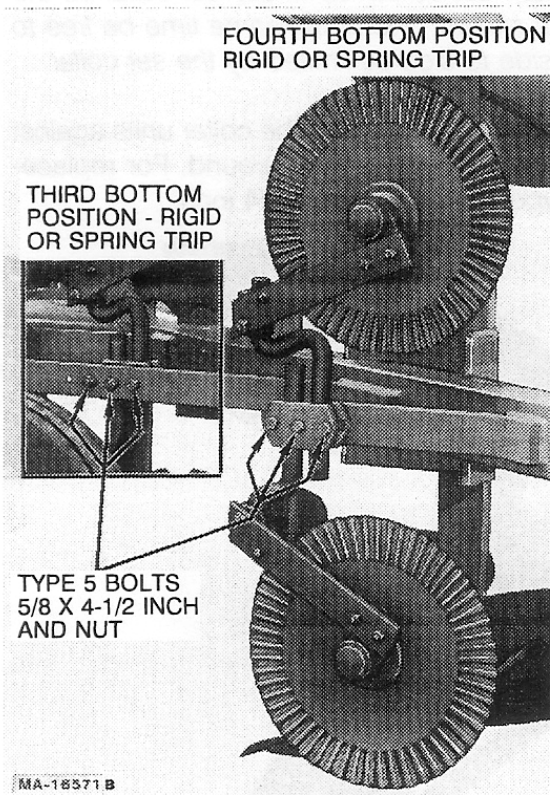
FOURTH BOTTOM POSITION RIGID OR SPRING TRIP
THIRD BOTTOM POSITION - RIGID OR SPRING TRIP
TYPE 5 BOLTS 5/8 X 4-1/2 INCH AND NUT
MA-16571B

Figure 40 - Installation of Rigid Shank Colters

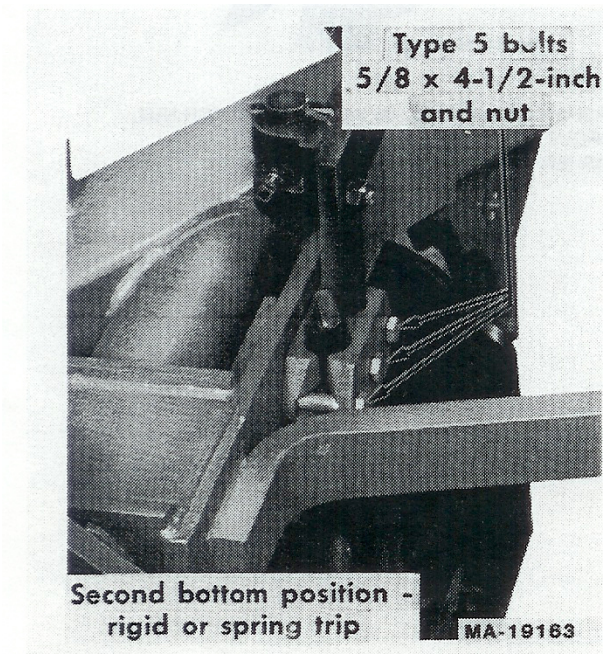

Figure 41 - Second Bottom Position

ROLLING COLTERS (FRONT COLTERS)

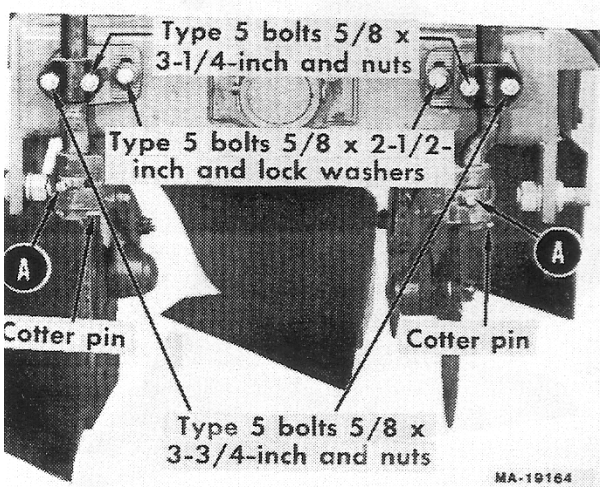

Figure 42 - Front Rolling Colters

TRASH PLATES (SUPER CHIEF BOTTOM)

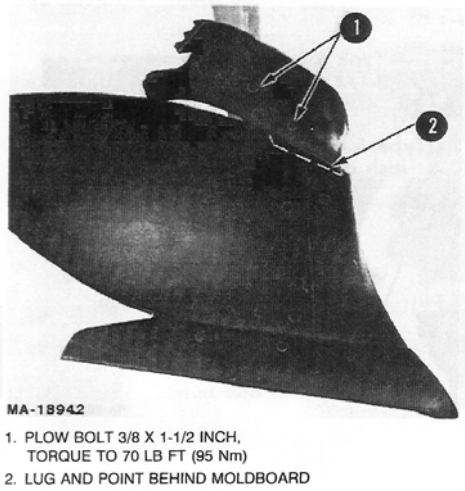

Figure 43 - Trash Plate Components

Remove the nuts and washers that secure the front. The washers may be discarded but the nuts should be retained.

Install the bracket against the frog, add washers furnished and nuts previously removed. Be sure the point of the trash plate shown at (2) is behind the moldboard before torquing the nuts to 70 ft-lb (95 Nm).

NOTE: *Tighten set screw "A" in the set collar so the colter will run straight and at the same time be free to swing from side to side as limited by the set collar.*

Shear bolts are used to protect the colter units against damage when plowing in rocky ground. For replacement, use type 5 bolts 7/16 x 1-3/4 inch.

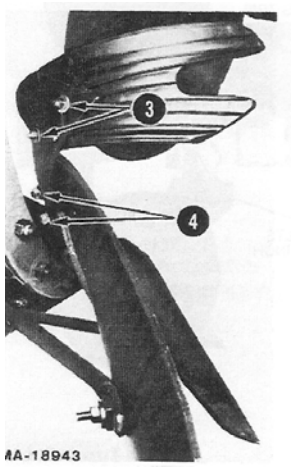

Figure 44 - Shear Bolts

LUBRICATION GUIDE

Be certain that all lubrication fittings are assembled in place, using the lubrication illustrations as a guide.

Always lubricate the plow thoroughly before taking it to the field. Use a pressure lubricating gun.

Be sure all fittings are free from dirt and paint so the lubricant is certain to enter the bearing.

Always force the lubricant through the full length of each bearing until it emerges at the end, carrying with it the worn lubricant and any dirt that may have entered the bearing.

Miscellaneous working parts not provided with lubrication fittings should be oiled daily with a good grade of lubricating oil.

Lubricant is cheap. Use plenty of it. Worn parts can be expensive to replace.

Keep your supply of lubricating oil and grease stored in clean containers and covered to protect from dust and dirt.

Keep the lubricating gun nozzle clean and wipe dirt from grease fittings before lubricating.

These symbols in the illustrations indicate the method of application and the hourly intervals to apply the lubricant.

Use a pressure lubricating gun and apply No. 2 Multi-Purpose Lithium grease sufficient to flush out the old grease and dirt. Lubricate at hourly intervals indicated on symbols.

Use oil can at hourly interval shown on symbols.

Hand lubricate these areas at the hourly intervals shown, using No. 2 Multi-Purpose Lithium grease

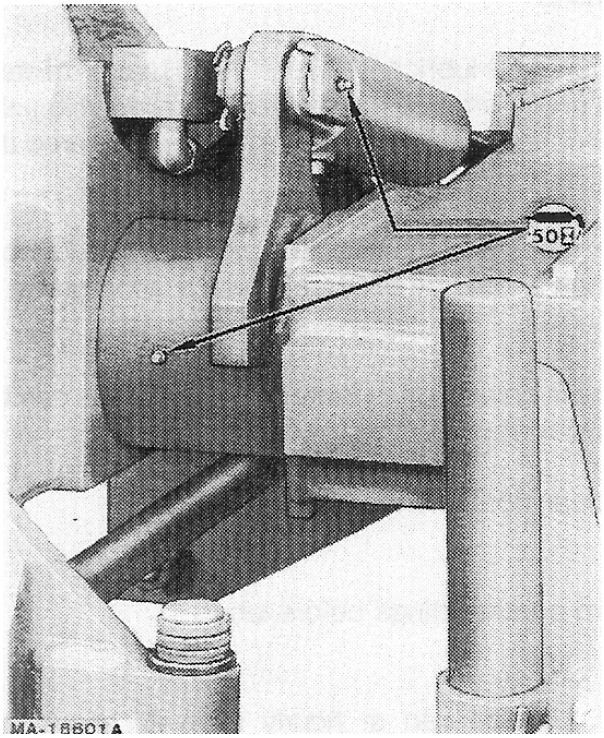

Figure 45 - Roll-Over Frame Pivot (Left Side)

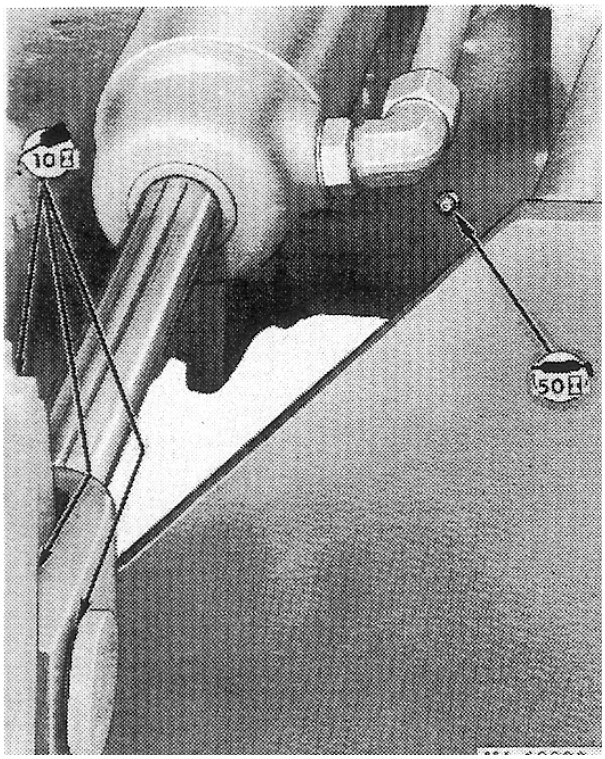

Figure 46 - Roll-Over Frame Pivot (Right Side)

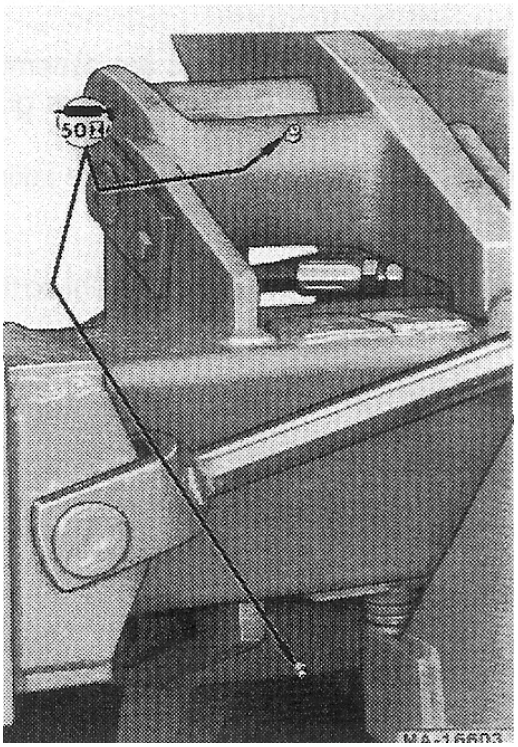

Figure 47 - Upper And Lower Automatic Trip Beam Pivots

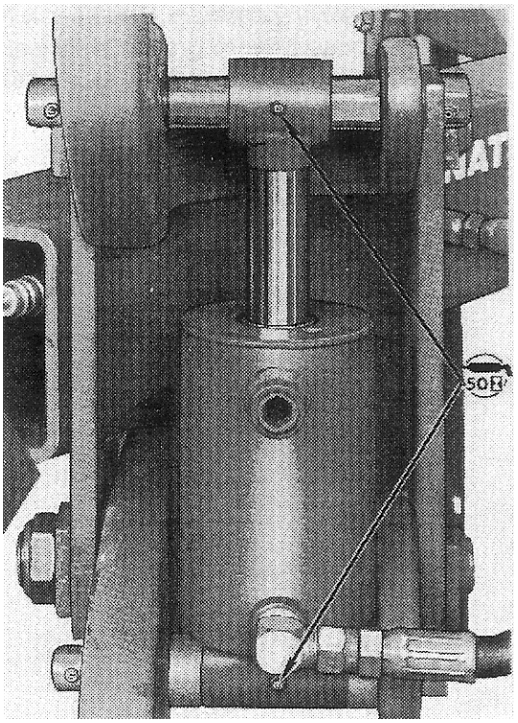

Figure 48 - Upper And Lower Reset Cylinder Anchor Pivots

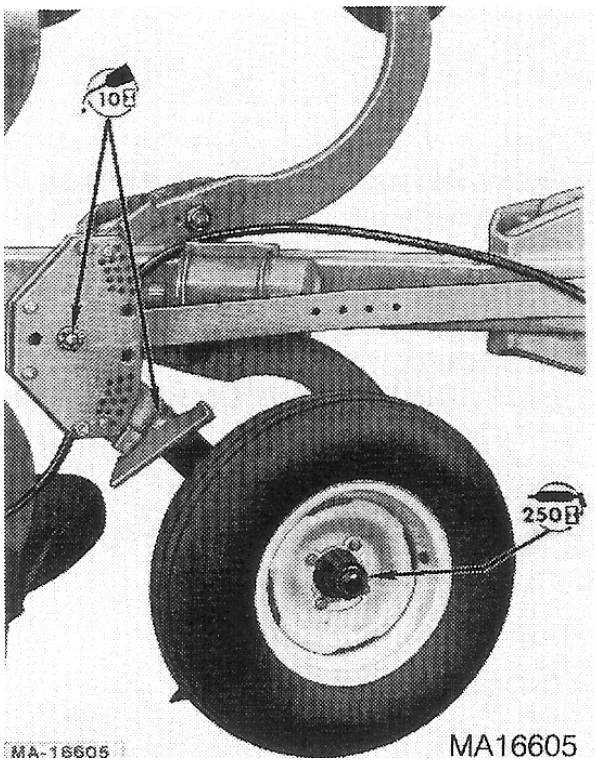

Figure 49 - Gauge Wheel Hub

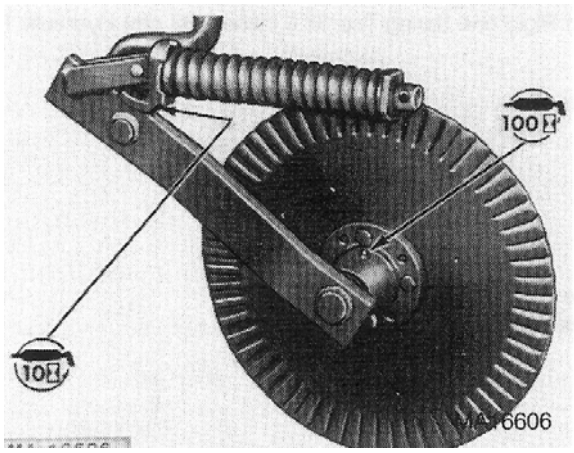

Figure 50 - Optional Colter Arm And Colter Hub (Welded Style)

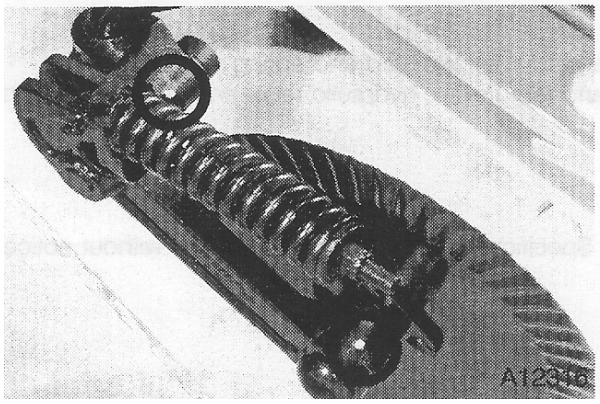

Figure 51 - Optional Colter Arm And Colter Hub (Cast Iron Style)

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SPECIFICATIONS

PLOW TYPE

- Fully mounted: two-way three, four, and five furrow.

TRACTOR APPLICATION

- Tractor must have adequate horsepower and hydraulic equipment for size of implement used.

HITCH EQUIPMENT REQUIRED

- Three point, Draft sensing, Category III (three) Hitch

Requirements for Tractors of Other Manufacturer

- Tractor with adequate power and stability and three-point Category III (three) Hitch

BOTTOM SIZES AVAILABLE

- 16 inch (41cm) three and four furrow Spring trip and Rigid
- 18 inch (46 cm) three and four furrow Rigid, Hydraulic reset and Spring Trip
- 18 inch (46 cm) five furrow Rigid

PLOWING DEPTH

- Up to 14 inches (35.6 cm). Depth stabilized by Gauge Wheel

TRASH CLEARANCE

- Fore and aft 25.5 inches (64.5 cm) 16 inch (41 cm) Plows
- 28.5 inches (72.5 cm) 18 inch (46 cm) Plows
- Vertical 30 inches (76.2 cm) Rigid and Spring Trip 32.6 inches (83 cm) Hydraulic Reset

BOTTOM ROTATION

- Double acting hydraulic cylinder

LEVELING CONTROL

- Leveling pin with spacers

LATERAL STABILITY

- Front Padded Landside
- Rear Dual padded Landside
- Optional Adjustable wide rear landside

BEAMS

- Rigid
- Hydraulic reset
- Spring trip

DEPTH STABILITY

- Gauge Wheel
- 7:50 14 inch 4-ply for three and four furrow, rigid and spring trip plows.
- 9:50 14 inch 6-ply for three and four furrow, hydraulic reset and five furrow, rigid plows.

Specifications are subject to change without notice.

.

CONVERSION FACTORS

U.S. Customary to SI (Metric) Units

	Multiply	By	To Obtain: Multiply
Area:	square foot (ft^2)	0.092 903	square meter (m^2)
	acre	0.404 686	hectar (ha)
Force:	ounce force (ozf)	0.278 014	newton (N)
	pound force (16f)	4.448 222	newton (N)
Length:	inch (in)	25 4	millimetre (mm)
	foot (ft)	0.304 8	meter (m)
	mile	1.609 344	kilometer (km)
Mass.	pound (lb)	0.453 592	kilogram (kg)
Mass/Area:	ton/acre	2241.702	kilogram per hectare (kg/ha)
Mass/Energy (Fuel Consumption)	pound per brake horsepower-hour (lb/bhp-h)	608 277 4	gram per kilowatt hour (g/kwh)
Mass/Volume. (Density)	pound per cubic yard (lb/yd^3) 0.593276	0.593 276	kilogram per cubic meter (kg/m^3)
Power	horsepower - U.S customary (hp - U.S customary)	0 745 700	kilowatt (kw)
Pressure:	pound per square inch (psi)	6.894 757	kilopascal (kPa)
Temperature:	degrees Fahrenheit (°F)	TC = 5/9 (TF-32)	degree Celsius (°C)
Torque	pound inch (lb in)	0.112 985	newton meter (Nm)
	pound foot (lb ft)	1 355 818	newton meter (Nm)
Velocity (Speed)	miles per hour (mph)	1.609 344	kilometer per hour (km/h)
Volume:	cubic inch (in^3)	16.387 06	cubic centimeter (cm^3)
	cubic foot (ft^3)	0 028 317	cubic meter (m^3)
	cubic yard (yd^3)	0 764 555	cubic meter (m^3)
	ounce-U.S fluid (oz)	29.573 53	milliliter (ml)
	quart-U.S. liquid (qt)	0 946 353	liter (1)
	quart-Imperial (qt)	1 136 523	liter (1)
	gallon-U S. liquid (gal)	3.785 412	liter (1)
	gallon-Imerrial (gal)	4 546 092	liter (1)
Volume/Area:	bushel (U.S.) per acre	0.087 078	cubic meter per hectare (m^3/ha)
Volume/Time (Flow)	gallon per minute (U S.) (gpm U.S.)	3 785 412	liter per minute (l/m)
	gallon per minute (Imperial) (gpm Imp)	4 546 092	liter per minute (l/m)
Horsepower	U.S customary hp	1.014	metric horsepower
	net engine hp	0.815*	P T.O. observed hp
	net engine hp	0 70*	mox drawbar hp

SI (Metric) Units to U.S. Customary

By	To Obtain
10.763 91	square foot (ft^2)
2.471 05	acre
3.596 942	ounce force (ozf)
0.224 809	pound force (lbf)
0.039 370	inch (in)
3.280 804	foot (ft)
0.621 371	mile
2.204 622	pound (lb)
0.000 446	ton/acre
0.001 644	pound per brake horsepower-hour (lb/bhp-h)
1.685 555	pound per cubic yard (lb/yd^3)
1.341 02	horsepower - U.S. customary (hp-U.S. customary)
0.145 038	pound per square inch (psi)
TF = 1.8 TC + 32	degree Fahrenheit (°F)
8.850 748	pound inch (lb in)
0.737 562	pound foot (lb ft)
0.621 371	miles per hour (mph)
0.061 024	cubic inch (in^3)
35.314 66	cubic foot (ft^3)
1.307 950	cubic yard (yd^3)
0.033 814	ounce-U.S. fluid (oz)
1.056 688	quart-U.S. liquid (qt)
0.879 877	quart-Imperial (qt)
0.264 172	gallon-U.S. liquid (gal)
0.219 969	gallon-Imperial (gal)
11.484 000	bushel (U.S.) per acre
0.264 172	gallon per minute (U.S.) (gpm U.S.)
0.219 969	gallon per minute (Imperial) (gpm Imp.)
0.986 3	U.S. customary hp

ART'S-WAY MANUFACTURING CO., INC. TECHNICAL MANUALS

Manuals are available from your local dealer or Art's-Way Manufacturing Co., Inc. for the operation, service and repair of your machine. For prompt convenient service, contact your local dealer for assistance in obtaining the manuals for your machine.

Your local dealer can expedite your order for operator manuals, illustrated parts catalogs, service manuals, and maintenance records.

Always give the Machine Name, Model and Serial Number so your local dealer can provide the correct manuals for your machine.

NOTE: Art's-Way Manufacturing Co., Inc. reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

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